The Golden Hand No. 3 and No. 4 Lode Mining Claims Proposed Plan of Operations

Intermountain Region

Payette National Forest

Krassel Ranger District, McCall, Idaho

February 2003

Draft Environmental Impact Statement

United States Department of Agriculture
Forest Service
Payette National Forest
PO Box 1026
McCall ID 83638
208 634-0700

File Code: 1950
Date: February 24, 2003

Dear Interested Party:

Enclosed for your review and comment is a copy of the Draft Environment Impact Statement (DEIS) for the Golden Hand No. 3 and No. 4 Lode Mining Claims Proposed Plan of Operations. Comments on the DEIS should be specific and should address the accuracy of the statement and merits of the alternatives discussed (40 CFR 1503.3). Comments must be received by April 21, 2003.

This DEIS analyzes three action alternatives, including the proponent's proposed plan (Alternative B) to develop the Golden Hand lode mining claims No. 3 and No. 4. Alternatives C and D include modifications to this plan for resource protection. A "No Action" alternative has also been analyzed. Alternative C has been identified as the preferred alternative.

The decision on the project will be subject to administrative review under procedures found in 36 CFR 215. Copies of the DEIS are available for review at Payette National Forest offices in Weiser, Council, New Meadows, and McCall, Idaho. The DEIS is also available on the Internet at www.fs.fed.us/r4/payette/main.html, under the "Reading Room" icon.

I want to encourage you to review and comment on this DEIS. Your interest in the management of the Payette National Forest and in particular, the Frank Church-River of No Return Wilderness is appreciated. If you have questions regarding this project, please contact Quinn Carver, Krassel District Ranger, or Ana Egnew, Interdisciplinary Team Leader and Land Management Planner, Krassel Ranger District at (208) 634-0600.

Sincerely,

/s/ ***Carol R. Feider*** (for)

MARK J. MADRID
Forest Supervisor

Enclosure

The Golden Hand No. 3 and No. 4 Lode Mining Claims Proposed Plan of Operations

Draft Environmental Impact Statement

USDA- Forest Service
Payette National Forest
Krassel Ranger District
Valley County, Idaho

February 2003

Lead Agency:	USDA Forest Service	
Responsible Official:	Mark Madrid, Forest Supervisor Payette National Forest P.O. Box 1026 McCall, Idaho 83638 (208) 634-0700	
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Abstract: American Independence Mine and Minerals, Inc. (AIMM) proposes to develop minerals on two valid mining claims on a portion of the historic Golden Hand Mine site in the Frank Church-River of No Return (FC-RONR) Wilderness. This Draft Environmental Impact Statement (DEIS) describes the alternatives for the Golden Hand No. 3 and No. 4 Lode Mining Claims Proposed Plan of Operations. The preferred alternative is Alternative C, the proposal modified for resource protection, which includes the following primary modifications to AIMM's plan: reduced road construction in the Wilderness, increased road improvements, use of Best Management Practices, no trenching, and a sequenced drilling scenario. The preferred alternative would require three one-time, site-specific non-significant amendments to the Forest Plan.

The Golden Hand mining claims project area is located in the FC-RONR Wilderness on the Krassel Ranger District, Payette National Forest. Comments on this DEIS are due by April 21, 2003.

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SUMMARY

SUMMARY OF THE DEIS

This Draft Environmental Impact Statement (DEIS) documents the analysis and discloses the potential site-specific effects of the Proposed Plan of Operations for the Golden Hand No. 3 and No. 4 Lode Mining Claims on resources in and adjacent to the project area located on the Krassel Ranger District of the Payette National Forest (PNF).

The Golden Hand Mine project area includes the 40 acres of claims No's 3 and 4 in the historic Golden Hand Mine site near Coin Creek, in the Big Creek drainage of the Frank Church River of No Return (FC-RONR) Wilderness. The project area also includes the 20-mile travel route from the claims to the Walker Millsite where ore samples would be tested (Chapter 1, Figure 1-2).

This analysis is tiered to the analysis in the Final Environmental Impact Statement (FEIS) prepared for the Payette National Forest Land and Resource Management Plan (1988, as amended), hereafter referred to the Forest Plan.

The Proposed Action

On April 14, 1996, American Independence Mines and Minerals, Inc. (AIMM) submitted a plan of operations (also referred to as plan) for Golden Hand No. 3 and No. 4 lode mining claims. The proposed plan contained a general description of the major activities that would take place at the claims. The PNF has since requested additional information and clarification on the proposed activities. The information contained in the proposed plan received in 1996 has been supplemented with information provided by AIMM from August 2000 through December 2002.

The plan for mineral development activities would be conducted under the authority of the 1872 Mining Law, as amended. Under Forest Service Mining Regulations at 36 CFR 228A governing activities authorized under the U.S. Mining Law as amended, the Forest Service is conducting an environmental analysis for the plan. In accordance with these regulations, the Federal action considered in this analysis is to respond to AIMM's proposed plan either by approving it as submitted, or by notifying AIMM of changes to the proposed plan needed to minimize environmental impacts.

In their proposed plan, AIMM proposes to develop the Golden Hand No.3 and No. 4 lode mining claims (also referred to as "the claims"). The minerals to be developed on the claims would be silver and gold. Under their proposed operating plan AIMM would:

- Maintain and widen portions of Forest Roads (FR) 371 and 373 to the Wilderness boundary at Pueblo Summit.
- Construct approximately 4 miles of road in the FC-RONR Wilderness with 0.8 miles constructed on claims. Most roads (3.5 miles) would be constructed on abandoned roadbeds.
- Develop 31 drill site locations (with a total of 48 drill holes, each up to 500 feet deep).
- Excavate 5 trenches (5 feet wide by 5 feet deep, totaling approximately 750 feet).

- ➢ Conduct underground work (clearing out, drilling, and possibly ore extraction) at two existing mine openings (adits).
- ➢ Place waste rock a minimum of 150 feet from drainages on existing waste dumps.
- ➢ Use a variety of vehicles and equipment including pickup trucks, a tandem drive flatbed truck, drill rig, dump truck, backhoe/loader, bulldozer, road grader, compressor, saws, underground mining machinery, and generator.
- ➢ Haul a maximum of 10 dump truck loads of the extracted ore 12 miles to the Walker Millsite for bulk metallurgical testing using a 14-cubic yard tandem-axle truck.
- ➢ Store fuel and explosives on or near the claims.
- ➢ Cut some trees on site to remove hazard trees and clear roads, and use the trees for mine timbers and firewood.
- ➢ Use a structure near the claims to house a six-person crew.
- ➢ Obtain water from a creek for mining operations (limited to 2500 gallons per day [GPD]), and domestic purposes (limited to 13,000 GPD).
- ➢ Conduct development activities from early summer through fall over a 10-year period.
- ➢ Conduct reclamation activities at the end of each season and at the end of the proposed operations.

Additional information on the proposed plan is available in Chapter 2 under Alternative B.

Purpose and Need

Law, regulation, agency policy, and court rulings define the purpose and need for the Forest Service response to AIMM's proposed plan of operations. The major laws and regulations governing such responses include the following:

- The 1872 Mining Law as amended (also referred to as the U.S. Mining Law)
- The 1897 the Organic Administration Act (16 USC 478, 551)
- The Multiple Use Mining Act of 1955 (30 USC 612)
- Forest Service 36 Code of Federal Regulations (CFR)
- The Wilderness Act of 1964

The Forest Service response is also guided by the following rulings:

- Following a validity examination, claims No. 3 and No. 4 were found to have valid existing rights.
- On August 12, 2002, the U.S. District Court in Idaho ordered the Forest Service to complete the Environmental Impact Statement (EIS) on AIMM's proposed operating plan for Golden Hand No. 3 and No. 4 lode mining claims on or before May 1, 2003.

Other state and federal laws and regulations may apply to plans submitted under 36 CFR 228A, depending on the nature of the proposal and resources affected. Such laws include the Clean Water Act, Endangered Species Act, National Historic Preservation Act, and others. Forest Service planning direction also defines the purpose to be achieved by the Forest Service action.

In summary, AIMM has the legal right to develop the mineral resources on their Wilderness claims where valid existing rights have been established, and the Forest Service has the legal authority to manage those activities to minimize, where feasible, environmental impacts on surface resources, including Wilderness. AIMM's right to develop is limited to activities that are reasonably incident to mining and not needlessly destructive, and by the obligation to comply with applicable state and federal laws. The Forest Service's right to manage AIMM's activity is limited in that it may not deny a plan of operation for development of such resources provided that it is reasonably incident and not needlessly destructive, and complies with applicable federal mining laws and regulations, and applicable state and federal laws and regulations related to air, water, and solid waste.

Decisions to be Made

The Responsible Official for this proposal is the Forest Supervisor of the Payette National Forest. Given the purpose and need, the Forest Supervisor reviews the proposed plan, the other alternatives, and the environmental consequences in order to make the following decisions:

(1) Approve the plan of operations as proposed, or

(2) Notify the proponent of changes or additions to the plan necessary to minimize, where feasible, adverse environmental impacts from mineral development activities on NFS lands, as required by Forest Service regulations (36 CFR 228A), and

(3) Whether to approve amendments to the Forest Plan.

Prior to approval of a plan, the PNF will require a reclamation bond to ensure that the lands involved with the mining operation are reclaimed in accordance with the approved reclamation plan (CFR 228.8 and 228.13).

Management Direction

Payette National Forest Land and Resource Management Plan

This analysis is tiered to the EIS for the Payette National Forest Land and Resource Management Plan (Forest Plan). The Forest Plan was approved in May 1988 by the Regional Forester and has been amended (see below). The Forest Plan establishes long-term management direction for the entire Forest (pp. IV-1 to 132) and provides more site-specific direction for PNF management areas. The proposed project is in the Wilderness Management Area. Direction for the management area is provided in the FC-RONR Wilderness Management Plan. The PNF Forest Plan (USDA 1988, p. I-2) incorporates FC-RONR Wilderness Management Plan direction by

reference. Specific resource management direction is provided at the beginning of each resource section in Chapter 3 of this DEIS.

The Forest Plan has been amended to include goals, objectives, standards, and guidelines for protection of anadromous and inland fisheries as defined in the *Interim Strategies for Managing Anadromous Fish-producing Watersheds in Eastern Oregon and Washington, Idaho, and Portions of California* (known as "PACFISH") (USDA and USDI 1995) and the *Inland Native Fish Strategy* (known as "INFISH") (USDA 1995). Both are interim habitat protection and restoration strategies designed to protect and improve aquatic health using Riparian Habitat Conservation Areas (RHCA) and Riparian Management Objectives (RMO). PACFISH direction applies to the project area. Additional direction on these strategies is described in the Fisheries Resource, Geology and Minerals, and Soil and Water Resources sections.

Frank Church-River of No Return (FC-RONR) Wilderness Management Plan

The FC-RONR Wilderness Management Plan (Wilderness Plan) provides management direction for each of the four National Forests (Bitterroot, Salmon-Challis, Nez Perce, and Payette) administering portions of the FC-RONR Wilderness. The Wilderness Plan direction for minerals states, "Ensure that all operations are conducted so as to minimize adverse environmental impacts on surface resources" (USDA 1985, p. 44). For minerals access, the Wilderness Plan includes "Reasonable access cannot be denied, but should be located to have the least long lasting impact on wilderness values" and; "The use of motorized access by ground or air to claims shall be authorized only when proven essential" (USDA 1985, p. 44). Additionally, the Wilderness Plan states "Limit road, trail… construction to those clearly identified as essential to the operation." Direction pertaining to use of a Forest Service minerals examiner states "Utilize Forest Service Mineral Examiners to assess the proposed mineral development in determining that proposed methods of development are necessary and reasonable and if the proposed operation is the next logical step in the orderly development of the mineral resource" (USDA 1985, p.43). Additional Wilderness Plan direction specific to resources is provided in Chapter 3.

Scoping

The Forest received 212 oral and written comments from the public, agencies, organizations, and Tribal governments on the proposed plan. The Interdisciplinary Team and the Responsible Official analyzed these comments and developed issues for the Golden Hand No. 3 and No. 4 Lode Mining Claims Proposed Plan of Operations.

Significant Issues

The following significant issues were used to develop alternatives and mitigation measures:

Issue #1: The effects of the proposed activities on mineral development.

Issue #2: The effects of the proposed activities on roads and access management in the analysis area.

Issue #3: The effects of the proposed activities within the FC-RONR Wilderness on the wilderness character.

Issue #4: The effects of the proposed activities within the FC-RONR Wilderness on the visitors' wilderness experience.

Issue #5: The effects of the proposed activities on water quality.

Issue #6: The effects of the proposed activities on riparian areas and wetlands.

Issue #7: The effects of the proposed activities on fish populations and habitat of concern (threatened and endangered fish species, sensitive species, and Management Indicator Species).

Issue #8: The effects of the proposed activities on wildlife populations and habitat of concern (threatened and endangered wildlife species, sensitive species, Management Indicator Species, and Idaho Species of Concern)

Issue #9: The effects of the proposed activities on noxious weed establishment and spread in and adjacent to the project area.

Issue #10: The effects of the proposed activities on cultural resources and Tribal trust responsibilities.

Alternatives

The ID Team developed the range of alternatives and mitigation measures based on the Purpose and Need and the significant issues identified above. Four alternatives were analyzed in detail, including the "No Action" alternative. These alternatives are described below.

Alternative A- No Action

The National Environmental Policy Act (NEPA) requires consideration of a "No Action" alternative. However, under Forest Service mining regulations at Title 36 Code of Federal Regulations (CFR) 228 Subpart A, this option can only be considered as an intermediate step in processing a plan of operation, provided that it has been properly submitted under the authority of the U.S. Mining Laws. For example, some proposed plans or parts of proposed plans of operation may not represent logical and sequential development of mineral property, may not be feasible, may not comply with applicable state or federal laws, or may not be reasonably incident to mining. In such cases, the Forest Service may not simply deny approval of the plan, but has the obligation to notify the operator as required under 36 CFR 228.5, of changes to be made that are necessary for its approval. Ultimately, in accordance with law and regulation, holders of valid mining claims have a legal right to develop their claims and a reasonable plan of operations must be identified and approved.

Alternative B- The Proposed Plan

This alternative is the proposed plan of operations for the Golden Hand No. 3 and No. 4 lode mining claims submitted by American Independence Mines and Minerals, Inc. (AIMM). The proposed plan would allow for mineral development of the mining claims, which includes: maintaining and widening access roads to Pueblo Summit, constructing 4 miles of road in the FC-RONR Wilderness, developing 31 drill sites, and excavating 5 trenches on claims No. 3 and No. 4 (Chapter 2, Figure 2-1). Additional features specific to this alternative are described in Table S-1 and Chapter 2 of the DEIS.

This alternative does not include Forest Plan management requirements or specific mitigation measures, and would require twelve one time, site specific, non-significant Forest Plan amendments. Amendments to the Forest Plan would be required for non-compliance with standards and guidelines for visual resources, water quality, Stream Protection Zones, cultural resources, noxious weeds, minerals, and fisheries. Additional information on these amendments is provided under Alternative B in Chapter 2.

Alternative C

This alternative modifies the proposed plan of operations submitted by AIMM to ensure that National Forest System lands, including those under mining claim locations, are used only for purposes required for and reasonably incident to mining and in a manner that minimizes adverse environmental impacts. Based on the information provided in the Surface Use Analysis (Abbay 2003, Appendix B), the modified alternative is considered viable because it provides the opportunity for AIMM to achieve it's stated goals while minimizing impacts to the environment. This alternative would allow most of AIMM's proposed development activities using a sequenced implementation schedule starting in the area of the inferred ore deposit (Chapter 2, Figure 2-2).

This alternative would allow AIMM's proposed development activities with the following primary modifications to minimize adverse environmental impacts: limits on vehicle and equipment size, less road construction in the Wilderness, a sequenced drilling scenario, no trenching, restrictions on activities in Riparian Habitat Conservation Areas (RHCAs), and use of Best Management Practices. This alternative includes management requirements and mitigation measures described in Chapters 2 and 3, and Appendix D. Additional features specific to this alternative are described in Table S-1.

This alternative primarily responds to fisheries and water quality issues. Some Wilderness issues were addressed, in part, by requiring the operators to live off-site, limiting the timing and duration of the operations, and by limits on tree-cutting in the Wilderness.

Alternative C would require three one time, site specific, non-significant amendments to the Forest Plan that would not change overall Forest Plan goals, objectives, Desired Future Conditions, or associated outputs. These amendments would be required for non-compliance with standards and guidelines for visual resources, fisheries, and Wilderness Plan direction. Additional information on these amendments is provided under Alternative C in Chapter 2.

This alternative would approve activities found reasonably incident to mining, at this time. It does not preclude approval in the future of additional activities (such as trenching) that are found reasonably incident following appropriate review, analysis, and documentation.

Alternative D

Alternative D modifies AIMM's proposed plan of operations to ensure that National Forest System lands, including those under mining claim locations, are used only for purposes required for and reasonably incident to mining and in a manner that minimizes adverse environmental impacts. This alternative was considered viable based on the information provided in the Surface Use Analysis (Abbay 2003, Appendix B). This alternative responds to Wilderness, fisheries, and water quality issues by restricting access to the claims to primitive means.

Key components of this alternative include: no road construction or motorized access in the Wilderness, no trenching, and sequenced drilling in and around the inferred ore deposit. Alternative D includes management requirements and mitigation measures described in Chapters 2 and 3, and Appendix D. Additional features specific to this alternative are described in Table S-1.

Alternative D would require an amendment to the Forest Plan. It is a one time, site specific, non-significant amendment that would not change overall Forest Plan goals, objectives, Desired Future Conditions, or associated outputs, but would amend visual resource standards and guidelines. Additional information on this amendment is provided under Alternative D in Chapter 2.

This alternative would approve activities found reasonably incident to mining, at this time. It does not preclude approval in the future of additional activities (such as trenching) that are found reasonably incident following appropriate review, analysis, and documentation.

Monitoring and Evaluation

Monitoring and evaluation are the control systems for implementation of the Forest Plan. Through monitoring, the Forest collects data to determine whether the project has produced the potential effects described in Chapter 3. Through evaluation, the Forest reviews the monitoring results and determines if adjustments to the project are needed. Table 2.5 in Chapter 2 summarizes the monitoring that would occur if an action alternative were implemented. Appendix E contains the detailed monitoring plans.

Comparison of Alternatives

Table S-1 below compares the activities by alternative. Table S-2 compares the environmental effects of the alternatives on the significant issues by indicator(s). Additional information on effects is provided in Chapter 3.

Identification of the Preferred Alternative

Council on Environmental Quality (CEQ) regulations require agencies to identify the preferred alternative or alternatives if one or more exists (40 CFR 1502.14[e]). Alternative C has been

identified as the preferred alternative for the Golden Hand No. 3 and No. 4 Lode Mining Claims Proposed Plan of Operations.

Table S-1. Comparison of Project Features for each Action Alternative Considered for the Golden Hand Mine Project

Component	Alternative B Proposed Plan	Alternative C Modified for Resource Protection	Alternative D Non-Motorized Access
Scope of Operations	New road construction, drilling, trenching, extraction of bulk samples	New road construction, drilling, excavation of bulk samples from underground, motorized access	Drilling and extraction of bulk samples by foot and pack stock
Access & Road Maintenance	Maintain minimum 10 feet road widths, limited dips (cross drains), armoring	FR 371 & 373 maintain current road widths; install culverts, dips, gravel, bridge	FR 371 & 373 maintain as in C; Wilderness access foot, pack stock
Road Construction	4 miles	3.4 miles w/BMPs, no roads off old roadbeds in RHCAs or steeper soil saturation zones	None
Development Work	31 drill & 5 trench sites (total 750 ft at 5'x5'); clean adits w/limited extraction; haul maximum 10 dump truck loads ore to Walker Millsite for bulk testing	Sequence up to 31drill sites on roadbeds or off with mitigation to within 50' of stream; no trenches; haul max. 10 dump truck loads ore to Walker Millsite for testing	Sequence up to 14 drill sites in vicinity of inferred ore deposit; drill with mitigation to within 50' of stream; no trenches; haul samples to Walker Millsite for testing
Vehicles and Equipment	14 yd^3 tandem axle dump truck, pickup truck (2), haul truck One round trip per operating season for equipment	All vehicles <7' tread width. CAT D250D articulated dump truck (or equivalent) with 7' tread width, pickup truck (2); 8' track width for equipment One round trip per operating season for authorized equipment	All vehicles <7' tread width and equipment 8' track width to Pueblo Summit. As in Alt. C to Pueblo Summit. Foot travel or pack stock to mine site One round trip per operating season for authorized equipment to Pueblo Summit
	Bulldozer in size range of a Cat D7 or smaller	Bulldozer	Not needed or out of Wilderness only
	Austin Western 99h road grader.	Road grader	Road grader - outside of Wilderness only.
	Air compressor (≤600 cfm)	Air compressor (≤600 cfm)	Air compressor (≤600 cfm) (pack/skid)
	Light plant	Light plant	No
	John Deere 450 backhoe/loader	Rubber tired backhoe/loader	Not needed – no trenching
	Smaller truck or track-mounted core or reverse circulation type drill rigs	Drill rig (portable and/or truck mounted)	Drill – backpack or stock portable
	Underground mining machinery	Underground mining machinery	Portable
	Saws	Saws	Saws

Component	Alternative B Proposed Plan	Alternative C Modified for Resource Protection	Alternative D Non-Motorized Access
	Generator	Generator for mining purposes only	Generator for mining purposes only
Hazardous Materials	Fuel quantities < 250 gallons in sealed tank or barrel containers on in going trucks	Fuel quantities < 250 gal. in sealed tank or barrel containers. Fuel storage on claim, outside RHCAs. Carry spill prevention kits and fire extinguishers. Explosives per approval	As in Alt. C to summit, but in portable containers in the Wilderness. Use of explosives per approval
Timbers	Timbers cut out of sight of trails except hazard trees along trail or road. Used as firewood or mine timbers	Cut timber outside of Wilderness in designated area and haul to site (Figure 1-2). Forest Service would identify and mark trees to be cut	For drill platforms – Forest Service would identify and mark trees to be cut on claims
Work Crew and Housing	House 6 people in bunkhouse (need to restore for safety, occupancy in Wilderness not compliant w/FS direction). Existing outhouse for human waste. Domestic water hauled to dump or pickup station. Burn garbage, unburnable material haul to landfill	Outside of Wilderness. Vehicle access to the mining claims would eliminate the need for residential occupancy onsite	Approx. 6 individuals inhabit wall tents on claims use pit toilet, bear proof containers, gray water containment
Timing and Duration	120 days or less each operating season for a period of up to 10 years	120 days or less each operating season for up to 3 years. Most operations between 7/1 and 9/15	120 days or less each operating season for up to 3 years. Limited operation after 8/15
Water	Believe exempt from permitting and filing requirements. Divert water from creek with pipe. "Right" limited to 13,000 GPD for domestic purposes & 2,500 GPD w/rate of .04 CFS for mining purposes	A water rights filing, including the amount and period of use, is required. Divert w/pipe from creek on claims, limited to 10% of streamflow at confluence w/Coin Creek. No ditches or dams	Same as in Alt. C
Noxious Weed Management	Not specified	Wash all equipment before entering the NFS lands, revegetation work with certified weed-free materials, monitoring to identify & treat noxious weed infestations	Same as Alternative C, livestock feed certified weed-free
Reclamation - interim or seasonal	Waterbar on-claim roads. Seed cut and fill slopes if natural revegetation not progressing satisfactorily	Remove all equipment & seed all disturbed sites with a certified weed free native seed mix Fill & reclaim trenches and drill holes	
- final	Only at end of mining. Waterbar roads and trails not used by foot or horse traffic. Seed with grass	Backfill drill holes. Fully recontour most roads used with equipment approved in plan. Partially recontour roads used as trails. Reseed disturbed areas with a certified weed-free native seed mix and mulch. Haul out	Backfill remaining drill holes. Reseed all disturbed areas with a certified weed-free native seed mix and mulch. Remove tools, and supplies. Reclaim

Component	Alternative B Proposed Plan	Alternative C Modified for Resource Protection	Alternative D Non-Motorized Access
		vehicles, tools, equipment, and supplies. Reclaim gravel site at Werdenhoff Mine	gravel site at Werdenhoff Mine

Table S-2. Comparison of Alternatives by Effects to Significant Issues for the Golden Hand Mine Project

INDICATORS	ALT A	ALT B	ALT C	ALT D
Issue #1- Mineral development				
Geologic info. obtained	Mapping -Sampling -Geophysical surveys	As in plan: -Mapping -Sampling -Geophysical surveys -Drill data -Underground mapping, sampling	Similar to plan, no trenching	Similar to plan, drilling around ore reserve, no trenching
Reasonably incident activities (per Surface Use Analysis)	Yes	No	Yes	Yes
Comply w/ PACFISH mineral direction items	5 out of 5 comply	1 out of 5 complies	4 out of 5 comply	5 out of 5 comply
Issue #2- Roads and access management				
Changes in miles of roads	No change	+4 miles temporary	+3.4 miles temporary	No change
Condition of roads outside Wilderness	No change	No improvement	Major improvement	Major improvement
Condition of roads and trails in Wilderness	No change	Non-compliant	Non-compliant	Compliant
Issue #3- Wilderness character				
Effects on natural integrity	Maintained	Highest	High	Moderate
Effects on untrammeled condition	Maintained	Highest	High	Moderate
Issue #4- Wilderness experience				
Effects to solitude and sense of remoteness	Maintained	Highest	High	Moderate
Effects to primitive recreation	Maintained	Highest	High	Moderate
Issue #5- Water quality				
Est. sediment delivery on FR 371 and 373 (tons/yr)	18.4	19.6	1.5	1.5
Est. sediment delivery in Wilderness (tons/yr)	0.0075	5.1	1.0	0.0075
Risk of metal contamination	No change	Low risk, no monitoring	Lower risk, with monitoring	Lower risk, with monitoring
Issue #6- Riparian areas and wetlands				
Riparian areas and wetlands affected	None	0.11 acres in & out of Wilderness	0.06 acres	None

INDICATORS	ALT A	ALT B	ALT C	ALT D
Issue #7- Fish populations and habitat of concern				
Large Woody Debris (LWD)	No change	Potential to degrade	Maintain	Maintain
Sediment	No change	Degrade	Degrade in Wilderness, improve outside	No change in Wilderness, improve outside
Flow	No change	Degrade	Maintain	Maintain
Risk of chemical contamination	No change	Moderate risk	Low risk	Very low risk
Road density and location	No change	Increase	Increase	Maintain
Issue #8- Wildlife populations and habitat				
Amount of habitat modified for species of concern	None	Minimal	Minimal	Minimal
Effects of human activity on wildlife populations	No change	Displacement for up to 10 years	Displacement for up to 5 years	Displacement for up to 5 years
Issue #9- Noxious weed establishment and spread				
Establishment and spread of noxious weeds	No change	No specified mitigation measures	Mitigation measures	Mitigation measures
Issue #10- Cultural resources and tribal trust responsibilities.				
Compliance with: National Historic Preservation Act (NHPA) & Archaeological Resources Protection Act (ARPA)	Compliant, but still adverse effects	Compliant, but still adverse effects	Compliant, but still adverse effects	Compliant, but still adverse effects
Tribal trust responsibilities	No effect	Possible effects	Possible effects	Effects unlikely

CHAPTER 1. PURPOSE AND NEED

Contents

CHAPTER 1
PURPOSE AND NEED

Introduction

The Payette National Forest (PNF) completed this Draft Environmental Impact Statement (DEIS) to analyze the environmental consequences of approving a plan of operations (also referred to as the operating plan or plan) and alternatives to the plan for the Golden Hand No.3 and No. 4 lode mining claims. The proposed plan submitted by American Independence Mines and Minerals, Inc. (AIMM) outlines a mineral development project located in the Frank Church-River of No Return (FC-RONR) Wilderness on the Krassel Ranger District, PNF in Section 26, T22N, R9E, Boise Meridian (Figure 1-1) that would occur on a portion of the historic Golden Hand Mine site.

This DEIS has been prepared in compliance with the National Environmental Policy Act (NEPA) and other relevant federal and state laws and regulations. The DEIS analyzes and discloses the direct, indirect, and cumulative environmental impacts on resources in and adjacent to the Golden Hand project area that would result from approving the proposed plan and the alternatives. The document is organized into seven chapters:

1) ***Chapter 1. Purpose and Need:*** This chapter includes information on the history of the proposed plan, the purpose and need for the federal action (proposed action) being considered, and the proposed method of achieving that purpose and need. This chapter details how the Forest Service informed the public of the proposal and how the public responded. Based on the public response a range of issues is identified. This chapter explains management direction and laws and regulations that guide the analysis.
2) ***Chapter 2. Alternatives:*** This chapter provides a more detailed description of AIMM's proposed plan and the other alternatives. The alternatives were developed to more effectively meet the stated purpose and need for action, and are based on significant issues raised by the public, Forest Service resource specialists, and other agencies and organizations. Alternatives that were considered but eliminated are described. This chapter also provides a table comparing the alternatives.
3) ***Chapter 3. Affected Environment and Environmental Effects*:** This chapter describes the affected environment and the environmental effects of implementing the proposed plan and the other alternatives, including the No Action alternative. This analysis is organized by resource and includes the significant issues.
4) ***Chapter 4. Public Involvement:*** This chapter summarizes the scoping and public involvement efforts. It also summarizes the representative comments (by resource) received by the public in response to scoping.
5) ***Chapter 5. List of Preparers:*** This chapter lists the Interdisciplinary Team (ID Team) members and other contributors responsible for preparing the DEIS.
6) ***Chapter 6. References:*** This chapter contains the references cited in this document.
7) ***Chapter 7. Acronyms and Glossary:*** This chapter contains a list of acronyms and definitions of terms used in the DEIS.
8) ***Appendices:*** The appendices provide more detailed information to support the analyses presented in the DEIS, including cumulative effects, Best Management Practices, the Surface Use Analysis, monitoring plans, and other resource-specific information.

Additional documentation, including more detailed analyses of project-area resources, may be found in the Project Record located at the Krassel Ranger District in McCall, Idaho.

Proposed Action

On April 14, 1996, AIMM submitted a plan of operations (also referred to as plan) for Golden Hand No. 3 and No. 4 lode mining claims. The proposed plan contained a general description of the major activities that would take place at the claims. The PNF has since requested additional information and clarification on the proposed activities. The information contained in the proposed plan received in 1996 has been supplemented with information provided by AIMM from August 30, 2000 through December 13, 2002.

The plan for mineral development activities would be conducted under the authority of the 1872 Mining Law, as amended. Under Forest Service Mining Regulations at 36 CFR 228A governing activities authorized under the U.S. Mining Law as amended, the Forest Service is conducting an environmental analysis for the plan. In accordance with these regulations, the Forest Service decision considered in this analysis is to respond to AIMM's proposed plan either by approving it as submitted, or by notifying AIMM of the changes needed in the proposed plan.

In their proposed plan, AIMM proposes to develop the Golden Hand No.3 and No. 4 lode mining claims (also referred to as "the claims"). The minerals to be developed on the claims would be silver and gold. The claims encompass approximately 20 acres each and are located near Coin Creek, a tributary of Beaver Creek, which flows into Big Creek, a tributary of the Middle Fork Salmon River. Under their proposed operating plan AIMM would:

- Maintain and widen portions of Forest Roads (FR) 371 and 373 to Pueblo Summit.
- Construct approximately 4 miles of road in the FC-RONR Wilderness with 0.8 miles constructed on claims. Most roads (3.5 miles) would occur on abandoned roadbeds.
- Develop 31 drill site locations (with a total of 48 drill holes up to 500 feet deep each).
- Excavate 5 trenches (totaling approximately 750 feet [5 feet wide by 5 feet deep per trench]).
- Conduct underground work (clearing out, drilling, and possibly ore extraction) at two existing mine openings (adits).
- Place waste rock a minimum of 150 feet from drainages on existing waste dumps.
- Use a variety of vehicles and equipment including pickup trucks, a tandem drive flatbed truck, drill rig, dump truck, backhoe/loader, bulldozer, road grader, compressor, saws, underground mining machinery, and generator.
- Haul a maximum of 10 dump truck loads of the extracted ore 12 miles to the Walker Millsite for bulk metallurgical testing using a 14-yard tandem-axle ore truck.
- Store fuel and explosives on or near the claims.
- Cut some trees on site to remove hazard trees and clear roads, and use the trees for mine timbers and firewood.

- Use a structure near the claims to house a six-person crew.

- Obtain water from a creek for mining operations (limited to 2500 gallons per day [GPD]), and domestic purposes (limited to 13,000 GPD).

- Conduct development activities from early summer through fall over a 10-year period.

- Conduct reclamation activities at the end of each season and at the end of the proposed operations.

For a complete description of the proposed plan see Alternative B in Chapter 2. The project area includes the area of the claims in the FC-RONR Wilderness to the Walker Millsite past Edwardsburg (Figure 1-2).

Purpose and Need

Law, regulation, agency policy, and court rulings define the purpose and need for the Forest Service response to AIMM's proposed plan of operations. The major laws and regulations governing such responses include the following:

- The 1872 Mining Law as amended (also referred to as the U.S. Mining Law[s]), provides in part that, "...all mineral deposits in land belonging to the United States are free and open to exploration and the lands in which they are found are open to occupation and purchase." This granting of statutory rights to explore, develop, and gain title to the minerals estate of federal lands open to mineral entry, remain in effect today.

- The 1897 the Organic Administration Act (16 USC 478, 551) created the National Forest System, and at the same time opened these lands to entry under the 1872 Mining Law. This law also gives the Secretary of Agriculture authority to regulate activities conducted under the Mining Law.

- The Multiple Use Mining Act of 1955 (30 USC 612) reserved to the United States the right to use the surface of unpatented mining claims providing such use did not endanger or materially interfere with prospecting, mining or processing operations or reasonably incident uses.

- Regulations defining Forest Service authority to manage locatable mineral activities were adopted in 1974, and are codified in 36 CFR 228A. In accordance with these regulations, an approved plan of operation is required for any locatable mineral activity on National Forest System land that would cause a significant disturbance of surface resources. These regulations also require the Forest Service to conduct an analysis that meets the requirements of the National Environmental Policy Act (NEPA) for each plan of operation received. Forest Service responses to a proposed plan of operation are defined by regulation at 36 CFR 228.5. The overall purpose of these regulations as stated in 36 CFR 228.1, is to manage operations so as to minimize adverse environmental impacts on National Forest System surface resources.

- The Wilderness Act of 1964 requires the Forest Service to ensure that valid rights exist prior to approving locatable mineral activities inside a congressionally designated Wilderness

area. To establish valid existing rights, mining claimants must show they have made a discovery of a valuable mineral deposit on the claim(s) prior to the withdrawal date, and have maintained that discovery. The Wilderness Act allows for surface disturbing activities that are reasonably incident to mining or processing operations when valid rights have been found to exist (U.S. Congress 1964, Section 4[d-3]). The Wilderness Act also states that mineral leases, permits, and licenses covering lands within National Forest Wilderness, shall contain reasonable stipulations as may be prescribed by the Secretary of Agriculture for the protection of the wilderness character and consistent with the use of the land for the purposes for which they are leased, permitted, or licensed.

The Forest Service response is also guided by the following rulings:

- AIMM and Jim Collord located Golden Hand No's. 1-5 lode mining claims in 1979. In 1983, AIMM located Golden Hand No's. 6-8. Mr. Collord subsequently deeded his interest in claims No. 1-5 to AIMM. Following a validity examination, a hearing before the Department of Interior- Office of Hearings and Appeals, and subsequent appeals by both parties, the Interior Board of Land Appeals (IBLA) ruled in 1992 that the Golden Hand No's. 3 and 4 lode mining claims within the FC-RONR Wilderness were valid. Claim No. 8 is also valid because the government withdrew its contest against claim No. 8 in 1999. In summary, Golden Hand No's. 3, 4, and 8 lode mining claims have valid existing rights (Figure 1-3).

- On August 12, 2002, the U.S. District Court in Idaho ordered the Forest Service to complete the Environmental Impact Statement (EIS) on AIMM's proposed operating plan for Golden Hand No. 3 and No. 4 lode mining claims on or before May 1, 2003.

Other state and federal laws and regulations may apply to plans submitted under 36 CFR 228A, depending on the nature of the proposal and resources affected. Such laws include the Clean Water Act, Clean Air Act, Endangered Species Act, National Historic Preservation Act, and others. Forest Service planning direction also defines the purpose to be achieved by the Forest Service action.

In summary, AIMM has the legal right to develop the mineral resources on their Wilderness claims where valid existing rights have been established, and the Forest Service has the legal authority to manage those activities to minimize, where feasible, environmental impacts on surface resources, including Wilderness. AIMM's right to develop is limited to activities that are reasonably incident to mining and not needlessly destructive, and by the obligation to comply with applicable state and federal laws. The Forest Service's right to manage AIMM's activity is limited in that it may not deny a plan of operation for development of such resources provided that it is reasonably incident and not needlessly destructive, and complies with applicable federal mining laws and regulations, and applicable state and federal laws and regulations related to air, water, and solid waste.

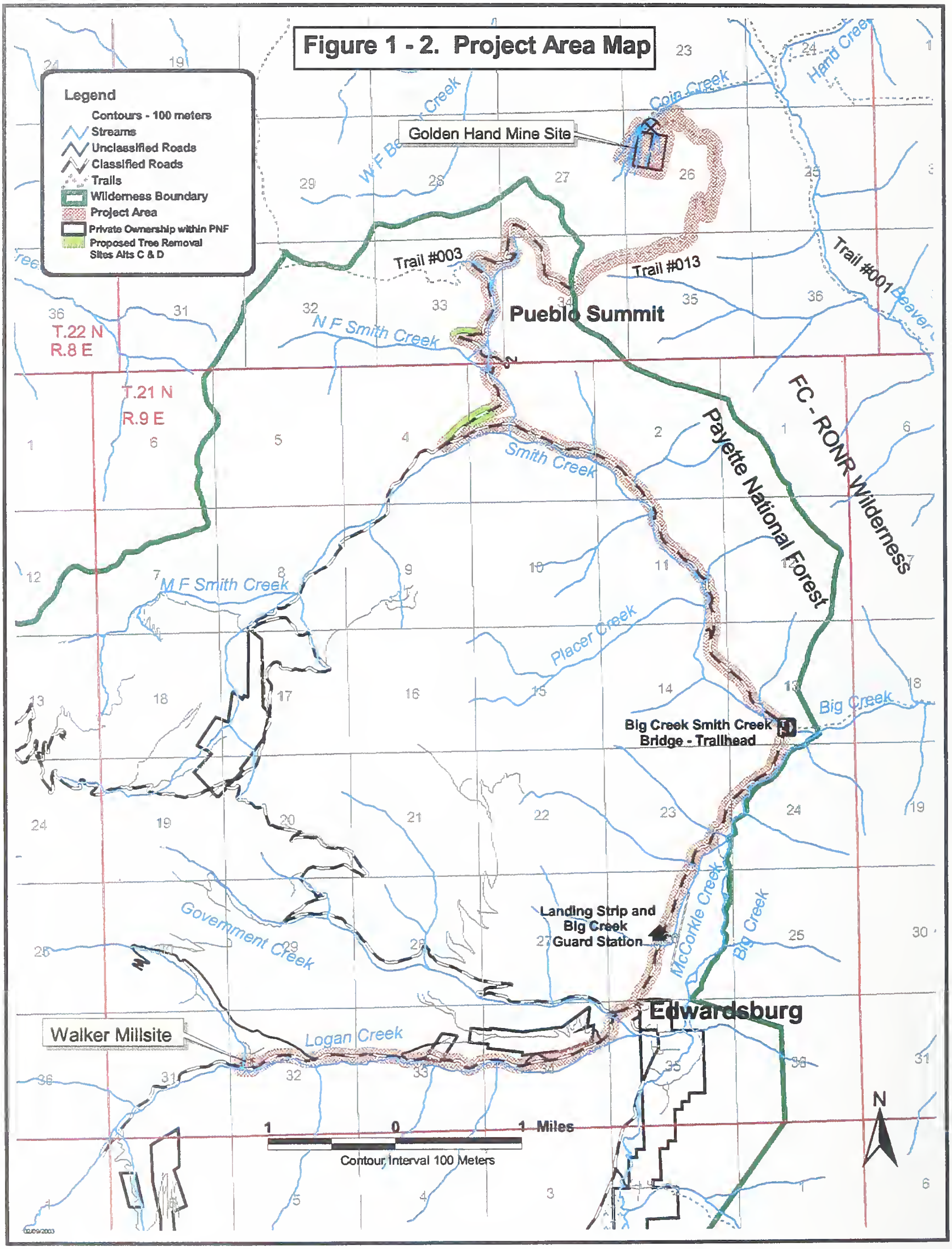
Figure 1 - 2. Project Area Map
Legend
Contours - 100 meters
Streams
Unclassified Roads
Classified Roads
Trails
Wilderness Boundary
Project Area
Private Ownership within PNF
Proposed Tree Removal Sites Alts C & D
Golden Hand Mine Site
Coin Creek
Hand Creek
Trail #003
Trail #013
Trail #001
Pueblo Summit
N F Smith Creek
Smith Creek
M F Smith Creek
Placer Creek
Payette National Forest
FC - RONR Wilderness
T.22 N
R.8 E
T.21 N
R.9 E
Big Creek
Big Creek Smith Creek Bridge - Trailhead
Landing Strip and Big Creek Guard Station
McCorkle Creek
Government Creek
Logan Creek
Walker Millsite
Edwardsburg
1 0 1 Miles
Contour Interval 100 Meters
N

Decisions to be Made

The Payette National Forest Supervisor, the deciding official for this project, has determined that preparation of an EIS is required for a decision on the proposed plan under Forest Service regulations governing locatable mineral activities on National Forest System (NFS) lands (36 CFR 228A) and Council on Environmental Quality (CEQ) regulations implementing the NEPA (40 CFR 1500-1508).

Given the purpose and need, the Forest Supervisor reviews the proposed plan, the other alternatives, and the environmental consequences in order to make the following decisions:

(1) Approve the plan of operations as proposed, or

(2) Notify the proponent of changes or additions to the plan necessary to minimize, where feasible, adverse environmental impacts from mineral development activities on NFS lands, as required by Forest Service regulations (36 CFR 228A), and

(3) Whether to approve amendments to the Forest Plan.

Prior to approval of a plan, the PNF will require a reclamation bond to ensure that the lands involved with the mining operation are reclaimed in accordance with the approved reclamation plan (CFR 228.8 and 228.13).

Once the DEIS is reviewed by interested parties, including the public, and the Final EIS is completed, the PNF Supervisor will issue a decision on AIMM's proposal in a Record of Decision (ROD). If the decision is to notify the proponent of changes or additions to the plan, the ROD will describe the changes and additions that are required. This decision will be appealable. AIMM may appeal the decision pursuant to either 36 CFR Part 215 or 36 CFR Part 251. Other parties may appeal the decision pursuant to 36 CFR Part 215.

Following resolution of any appeal, AIMM must change the plan as described in the ROD and resubmit it to the Forest Service along with any reclamation bond that is required. Once the Forest Service determines that the plan has been changed as required, and that the bond instrument is acceptable, it will notify AIMM that the plan is approved.

Management Direction

Payette National Forest Land and Resource Management Plan

This analysis is tiered to the EIS for the Payette National Forest Land and Resource Management Plan (Forest Plan). The Forest Plan was approved in May 1988 by the Regional Forester and has been amended (see below). The Forest Plan establishes long-term management direction for the entire Forest (pp. IV-1 to 132) and provides more site-specific direction for PNF management areas. The proposed project is in the Wilderness Management Area. Direction for the management area is provided in the FC-RONR Wilderness Management Plan. The PNF Forest Plan incorporates FC-RONR Wilderness Management Plan direction by reference (USDA 1988, p. I-2). Specific resource management direction is provided at the beginning of each resource section in Chapter 3 of this DEIS.

The Forest Plan has been amended to include goals, objectives, standards, and guidelines for protection of anadromous and inland fisheries as defined in the *Interim Strategies for Managing Anadromous Fish-producing Watersheds in Eastern Oregon and Washington, Idaho, and Portions of California* (known as "PACFISH") (USDA and USDI 1995) and the *Inland Native Fish Strategy* (known as "INFISH") (USDA 1995). Both are interim habitat protection and restoration strategies designed to protect and improve aquatic health using Riparian Habitat Conservation Areas (RHCA) and Riparian Management Objectives (RMO). Additional direction on these strategies is best described in the Fisheries Resource section in Chapter 3; other descriptions are provided in the Geology and Minerals and Soil and Water Resources sections.

Frank Church River of No Return Wilderness Management Plan

The FC-RONR Wilderness Management Plan (also referred to as the Wilderness Plan) provides management direction for each of the four National Forests (Bitterroot, Salmon-Challis, Nez Perce, and Payette) administering portions of the FC-RONR Wilderness. The Wilderness Plan direction for minerals states, "Ensure that all operations are conducted so as to minimize adverse environmental impacts on surface resources" (USDA 1985, p. 44). For minerals access, the Wilderness Plan includes "Reasonable access cannot be denied, but should be located to have the least long lasting impact on wilderness values" and; "The use of motorized access by ground or air to claims shall be authorized only when proven essential" (USDA 1985, p. 44). Additionally, the Wilderness Plan states "Limit road, trail… construction to those clearly identified as essential to the operation." Direction pertaining to use of a Forest Service minerals examiner states "Utilize Forest Service Mineral Examiners to assess the proposed mineral development in determining that proposed methods of development are necessary and reasonable and if the proposed operation is the next logical step in the orderly development of the mineral resource" (USDA 1985, p.43). Additional Wilderness Plan direction specific to resources is provided in Chapter 3.

Project Record

This EIS hereby incorporates by reference the Project Record (40 CFR 1502.21). The Project Record contains Specialist Reports and other technical documentation used to support the analysis and conclusions in this DEIS. These Specialist Reports are for the Soil and Water, Fisheries, Wildlife, Minerals and Geology, Wilderness, and Cultural Resources, TES Plant Species, and Roads and Access Management for the Golden Hand Mine Project. The use of Specialist Reports and the Project Record meets provisions of the Council on Environmental Quality (CEQ) regulations to reduce NEPA paperwork (40 CFR 1500.4), to make EISs analytic rather than encyclopedic, and to keep EISs concise and no longer than absolutely necessary (40 CFR 1502.2). The objective is to furnish enough site-specific information to demonstrate a reasoned consideration of the environmental impacts of the alternatives and how these impacts can be mitigated, without repeating detailed analysis and background information available elsewhere. The Project Record is available for review at the Krassel Ranger District, Payette National Forest, McCall, Idaho.

Public Involvement

The CEQ defines scoping as ``...an early and open process for determining the scope of issues to be addressed and for identifying the significant issues related to a proposed action" (40 CFR 1501.7). Among other things, the scoping process is used to invite public participation, to help

identify issues, and to obtain public comment at various stages of the EIS process. Although scoping is to begin early, it is really an iterative process that continues until a decision is made.

Scoping is a process designed to identify environmental issues related to the proposed action. The first opportunity for public involvement occurred when the PNF first received the proposed plan of operations in 1996 and public "scoping" was conducted. No decision was made at that time.

Scoping was again conducted when preparation of the EIS was resumed in the winter of 2002. The PNF published a Notice of Intent (NOI) to prepare an EIS in the Federal Register on April 19, 2002. The NOI invited comments on the proponent's plan of operations and the environmental analysis for the operating plan. The PNF also solicited comments from more than 476 interested parties on a Forest-wide mailing list. A press release and legal notice were issued in *The Star News*, a McCall newspaper. In addition, the Forest Service held a public meeting on May 21, 2002 at the Krassel Ranger District in McCall, Idaho. A subsequent meeting was held in Boise at the request of parties that could not travel to the public meeting in McCall. Outreach was made to the Nez Perce tribe through formal letters to the Tribal Chairman, a meeting and field review. This project has been listed on the Payette National Forest Quarterly Schedule of Proposed Actions since before the release of the NOI.

In response to these scoping activities, the PNF received 212 oral and written comments. Comments received are made part of the Project Record and are available for public review pursuant to the Freedom of Information Act. Additional information on the public involvement is provided in Chapter 4.

Availability of the DEIS

Availability of the DEIS was announced in the *Federal Register* and in notices in local papers. These notices started a 45-day comment period. The DEIS was mailed to federal and state agencies, American Indian and municipal offices, and anyone else who had requested them. The DEIS is also available for review in the "reading room" of the PNF website at: http://www.fs.fed.us/r4/payette/main.html.

Issues

Using the comments from the public, the tribes, and other agencies and organizations, the Interdisciplinary (ID) Team developed a list of issues to address. Issues are defined as a point of discussion, debate, or dispute about environmental effects. Issues were separated into two groups: significant issues and non-significant issues. The CEQ regulations specify only significant issues be the focus of the analysis. Issues determined not to be significant or that have been covered by prior environmental review are discussed only briefly and eliminated from detailed study [40 CFR 1500.1(b), 1500.2(b), 1500.4(c), 1501.7(3), 1502.2(b), 1506.3].

Significant issues are issues used to formulate alternatives to the proposed action, prescribe mitigation measures, or analyze environmental effects. Indicators are measures used to track the effects of the proposed actions on the issues. The major issues and indicators are summarized below, including representative public comments. Non-significant issues include issues that are: outside the scope of the proposed action; already decided by law, regulation, Forest Plan, or other higher level decision; irrelevant to the decision to be made; or conjectural and not supported by scientific or factual evidence. Non-significant issues are identified below with rationale for why they are non-significant.

Significant Issues

The significant issues identified during the analysis process include:

Issue No.	Issue	Resource Section
1	Mineral development	Minerals and Geology
2	Roads and access	Roads and Access Management
3	Wilderness character	Wilderness Resource
4	Wilderness experience	Wilderness Resource
5	Water quality	Soil and Water Resources
6	Riparian zones and wetlands	Soil and Water Resources
7	Fish populations and habitat of concern	Fisheries Resource
8	Wildlife populations and habitat of concern	Wildlife Resource
9	Noxious weed establishment and spread	Noxious Weeds
10	Cultural resources and tribal trust responsibilities	Cultural Resources

Issue #1: The effects of the proposed activities on mineral development.

Indicators:
- Geologic information obtained
- Reasonably incident activities
- Compliance with PACFISH Standards and Guidelines for minerals projects

Issue #2: The effects of the proposed activities on roads and access management in the analysis area.

Indicator:
- Changes in road miles and condition

Issue #3: The effects of the proposed activities within the FC-RONR Wilderness on the wilderness character.

Indicators:
- Effects on natural integrity
- Effects on untrammeled condition

Issue #4: The effects of the proposed activities within the FC-RONR Wilderness on the visitors' wilderness experience.

Indicators:
- Effects to solitude and sense of remoteness
- Effects to primitive recreation

Issue #5: The effects of the proposed activities on water quality.

Indicators:

- Estimated change in delivered sediment
- Amount and condition of stream crossings and roads within RHCAs
- Risk of metal contamination

Issue #6: The effects of the proposed activities on riparian areas and wetlands.

Indicator:

- Amount of riparian areas and wetlands affected

Issue #7: The effects of the proposed activities on fish populations and habitat of concern (federally listed species, sensitive species, and Management Indicator Species).

Indicators: Effects to Riparian Management Objectives (RMOs) as tracked by the following relevant fisheries habitat indicators:

- large woody debris (LWD)
- fine sediment levels in stream
- flow
- chemical contamination
- road density and location

Issue #8: The effects of the proposed activities on wildlife populations and habitat of concern (threatened and endangered wildlife species; Region 4 sensitive species; Management Indicator Species (MIS); and Idaho Species of Concern)

Indicators:

- Amount of habitat modified for threatened, endangered, MIS, Region 4 sensitive species, and Idaho Species of Concern.
- Effects of human activity on wildlife populations

Issue #9: The effects of the proposed activities on noxious weed establishment and spread in and adjacent to the project area.

Indicator:

- Increase in noxious weeds due to equipment transport and ground disturbance.

Issue #10: The effects of the proposed activities on cultural resources and Tribal trust responsibilities.

Indicators: Compliance with:

- The National Historic Preservation Act (NHPA) as amended
- The Archaeological Resources Protection Act (ARPA)
- Executive Orders pertaining to the consultation and coordination with American Indian Tribal Governments.

Non- significant Issues

The following non-significant issues were identified:

1. Fire Management
2. Claim Validity
3. Claim Purchase
4. Economics
5. Water Rights
6. Recreation
7. Plant Populations and Habitat
8. Visual Quality
9. Soil Productivity
10. Landslide Prone Areas
11. Public Rights-of-Way (RS-2477)

Non-significant Issue #1: Fire Management

Summary of Issue Analysis: Under Alternatives B and D, which allow occupancy in the FC-RONR Wilderness, the proponent would be required to follow regulations that any other campers in the Wilderness follow with regard to fire use (see Appendix A). Additional information about regulations with regard to transport and storage of fuel in the Wilderness can be found in Chapter 3 under Soil and Water, Minerals, and Fisheries.

Non-significant Issue #2: Claim Validity

Summary of Issue Analysis: Following a validity examination, a hearing before the Department of Interior-Office of Hearings and Appeals, and an appeal by both parties, the Interior Board of Land Appeals (IBLA) ruled in 1992 that the Golden Hand No's. 3 and 4 lode mining claims within the FC-RONR Wilderness were valid. The Forest Service chose not to further appeal that decision on claims No. 3 and No. 4. Claim No. 8 is also valid because the government withdrew its contest against claim No. 8 in 1999. Golden Hand No's. 3, 4, and 8 lode mining claims have valid existing rights.

Non-significant Issue #3: Claim Purchase

Summary of Issue Analysis: AIMM has established valid existing rights to develop the Golden Hand deposit. Congressional, Forest Service minerals management, and wilderness management direction allows for mineral development on valid claims within Wilderness. The issue of claim purchase is beyond the scope of this document that addresses the environmental impacts of a proposed plan of operations on mining claims with valid existing rights.

Non-significant Issue #4: Economics

Summary of Issue Analysis: AIMM's proposed plan of operations does not constitute a mine production plan. The economic benefits of this small "pre-development" plan would be minimal. The plan would provide jobs for six individuals for approximately four months a year for up to ten years. Further, based on the analyses conducted by the ID Team and the determination of a

Forest Service certified mineral examiner, a full production mine is not yet reasonably foreseeable though as data evolve during the 10 year duration of the plan, that could change. In that event, another plan would have to be proposed and a separate environmental analysis conducted. Consequently, any significant economic changes associated with a producing mine are highly speculative and not reasonably foreseeable at this time. The issue of the mining claim as a private property right is beyond the scope of this analysis, which simply seeks to analyze AIMM's proposed plan and a reasonable range of alternatives as directed by the NEPA.

Non-significant Issue #5: Water rights

Summary of Issue Analysis: Idaho Department of Water Resources (IDWR) administers water rights in the State of Idaho. AIMM must apply for a water right under ID Statute 42 (101, 103, 104) in order to divert water. The purpose of the water rights filing is to describe the purpose of the water use and ensure reasonable environmental protections. The need to obtain a water right is an issue regulated by the State of Idaho. The amount of water applied for in the water right can have impacts to National Forest resources, particularly threatened fish species. Hence, the amount of water to be used is a significant issue analyzed in the Fisheries Resource section in Chapter 3.

Non-significant Issue #6: Recreation

Summary of Issue Analysis: The ID Team considered the effects of the proposed action to recreationists in the portion of the project area outside of the FC-RONR Wilderness (from the millsite to Pueblo Summit along Forest Roads 343, 371, and 373). Essentially no public comments were received regarding the effects on recreation opportunities outside the Wilderness. Recreation activities along FR 343, 371, and 373 includes minor amounts of dispersed camping, sightseeing, travel to trailheads, and berry picking. Recreational parking occurs at the Logan Lake undeveloped trailhead on FR 343 and near the Smith Creek Cutoff undeveloped trailhead on FR 371. Improvements in the road condition may result in a slight increase in road use as disclosed in the Roads and Access Management section. These improvements may benefit recreation users traveling through the area. Conversely, the roadwork may remove small amounts of ground used for parking and dispersed camp locations. Such effects would be very minimal and limited to Alternative B.

Non-significant Issue #7: Plant populations of concern

Summary of Issue Analysis: A pre-field botanical review and field surveys were conducted in 2002 to determine whether threatened, endangered, or sensitive (TES) plant populations or habitat occur in the project area. Based on these surveys, no current or historic populations of TES or "watch" plants occur in or near the project area (Specialist Report - TES Plants).

Non-significant Issue #8: Visual Quality

Summary of Issue Analysis: Effects to scenic qualities were described in the Wilderness Resource section under wilderness character and experience. The visual issue is guided by Forest Plan direction that assigns "visual quality objectives" (VQO) to management areas. The PNF portion of the FC-RONR Wilderness is in Management Area 26. This area is assigned a VQO of "Preservation" in the FC-RONR Wilderness. "Preservation" is defined as, "allow ecological changes only...Management activities, except for very low visual impact recreation facilities, are prohibited." Under all action alternatives, the preservation VQO would not be met.

A one-time, site-specific, non-significant amendment to the Forest Plan is needed to allow for the proposed activities, which will further alter the visual setting at the Golden Hand Mine site and associated access roads in the Wilderness. This amendment would not change overall Forest Plan goals, objectives, Desired Future Conditions, or associated outputs.

- Amend Management Area 26 (FC–RONRW) standards and guidelines at p. IV-351, Visual Resource Inventory and Planning, as follows: "For the Golden Hand Plan Of Operations Project, allow activities within the project area of approximately 55 acres that would not meet the Visual Quality Objective of Preservation."

This Forest Plan amendment is not considered a significant change for two primary reasons. The first is that the enabling legislation for the FC-RONR Wilderness allowed development of valid mining claims – an activity that would not meet the "Preservation" VQO. The second is that the activities would affect an extremely small area covered by this VQO. Less than 55 acres or .00002 percent of the FC-RONR Wilderness would be affected by the proposed activities. This amendment only applies to the Golden Hand project area. Additional information is provided in Chapter 2 under the alternative descriptions, and in the Wilderness Resource section, Chapter 3.

Non-significant Issue #9: Soil productivity

Summary of Issue Analysis: Forest Plan soil standards are designed to maintain soil productivity within a certain proportion of an activity area. The standards require:

- A minimum of 80 percent of an activity area will remain in a non-detrimentally disturbed condition. Detrimental disturbance is "The alternation of the natural soil characteristics which result in significant or prolonged degradation of off-site resources quality standards…."
- Total or essentially total soil resource commitment (TSRC) will not exceed 5 percent of an activity area. TSRC is "A conversion of a productive site to an essentially nonproductive site for a period of more than 50 years."

The Forest Plan (USDA 1988, as amended) defines an activity area as "The total area for which a ground impacting activity is planned…This definition excludes site intensive developments such as campgrounds, mines, drill sites, aggregate source areas, roads, and water developments." The Forest Plan requirements for TSRC and detrimental disturbance (DD) are limited to an activity area. The definition of activity area excludes mines, drill sites, and roads. Activities that could affect soils in the Golden Hand project are mines (including trenching), drill sites, and roads. Hence, the project effects are not significant to soil productivity as defined by the Forest Plan. Auxiliary impacts to soils from the proposed activities in relation to slope stability and erosion are addressed in the Soil and Water Resources, Fisheries Resource, and Roads and Access Management sections.

Non-significant Issue #10: Landslide prone areas

Summary of Issue Analysis: The SINMAP model is used on the PNF to identify landslide prone areas. The SINMAP computes and maps slope stability based on geographic information, primarily digital elevation data. The project area and specifically the claim area where new road construction and other soil disturbing activities are proposed is rated low hazard and not considered landslide prone. On-the-ground surveys of the existing roads and abandoned roadbeds supported the model results. The area of the claims occurs on a landtype (109e) considered at

moderate to high risk for road cut failures. The potential effects of this are analyzed in the Roads and Access Management section in Chapter 3.

Non-significant Issue #11: Public Rights-of-Way (RS-2477)

Summary of Issue Analysis: The determination that any public rights-of-way exist in the project area is beyond the scope of this analysis. To establish rights-of-way requires a number of steps as outlined in Forest Service Region Four direction based on recommendations from the Office of General Counsel (OGC) (dated February 12, 2000).

1. It must be shown that the statutory grant of the right-of-way was accepted prior to inclusion of the land in the National Forest System (NFS).
2. It must be shown that a highway had been constructed and dedicated to public use in accordance with applicable laws prior to inclusion of the land into the NFS.
3. It must be shown that the right-of-way has been continuously used and maintained as a public highway. If not, it may be deemed abandoned by applicable laws.

The assertion provided to us does not contain sufficient information to determine if any of these elements have been met. Accordingly, the Forest Service cannot evaluate or concur with the assertion for the public right-of-way. Without sufficient evidence of title, the Forest Service cannot recognize any claim of a real property interest in land under its administration.

In addition, Federal law codified at 16 U.S.C. 551 requires compliance with regulations of the Secretary of Agriculture governing the use and occupancy of NFS lands. Regulations of the Secretary of Agriculture at 36 CFR 251.50 require that authorization be obtained from the Forest Service for all use and occupancy of NFS lands. Regulations at 36 CFR 261.10(a) prohibit constructing or maintaining roads or trails across NFS lands without appropriate Forest Service authorization. Even where a valid right-of-way exists on a National Forest under R.S. 2477, the United States retains ownership of the land beneath and adjacent to the right-of-way, "the servient estate." Any use, construction, reconstruction, or maintenance of roads that may affect that land is subject to regulation by the Forest Service, including requirements for authorizations, to ensure that activities are within the scope of the right-of-way and do not unreasonably or unnecessarily degrade Federal property. The assertion of a right-of-way under R.S. 2477 does not exempt the claimant from the application of these regulations.

Legal Requirements

This DEIS adheres to the following federal legal requirements:

Central Idaho Wilderness Act (CIWA) and the Wilderness Act: The US Congress designated the FC-RONR Wilderness in 1980 with the passage of the CIWA. The CIWA mandated the development of a comprehensive wilderness management plan. The CIWA includes some mining direction prohibitions for areas of the FC-RONR Wilderness but specific direction is provided in the Wilderness Act (U.S. Congress 1980, 16 USC 1274).

The Wilderness Act of 1964 (amended in 1978) was enacted by Congress to "secure for the American people, an enduring resource of wilderness for the enjoyment of present and future generations". This act was passed "in order to ensure that an increasing population, accompanied by expanding settlement and growing mechanization, does not occupy and modify all areas with in the United States and its possessions, leaving no lands designated for preservation and protection in their natural

condition..."(Section 2 [a]). The Wilderness Act contains provisions for mining that include: "Mining locations lying within the boundaries of said wilderness areas shall be held and used solely for mining or processing operations and uses reasonably incident hereto...subject to valid existing rights" (Section 4 [d-3]). Additional provisions in the Act are described in the Wilderness Resources section, Chapter 3.

The National Environmental Policy Act (NEPA) of 1969 (P.L .91-190): The purposes of this Act are "To declare a national policy which will encourage productive and enjoyable harmony between man and his environment, to promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of man; to enrich the understanding of the ecological systems and natural resources important to the Nation; and to establish a Council on Environmental Quality" (42 U.S.C. Sec. 4321). NEPA establishes the format and content requirements for environmental analyses and documentation. The entire process of preparing this DEIS was undertaken to comply with NEPA.

The National Forest Management Act (NFMA) of 1976 (P.L. 4-588): This Act guides development and revision of National Forest Land Management Plans and contains regulations that prescribe how land and resource management planning is to be conducted on NFS lands to protect National Forest resources. The different alternatives for this project were developed to comply with NFMA, and represent varying degrees of resource protection.

The Endangered Species Act (ESA) of 1973, as amended: The purposes of this Act are to provide for the conservation of threatened and endangered species and their habitats. The PNF is required by the ESA to ensure that any actions it approves will not jeopardize the continued existence of threatened and endangered species or result in the destruction or adverse modification of critical habitat. The PNF has prepared biological assessments that evaluate the potential effects of proposed activities on threatened and endangered species that may be present in the analysis areas. The assessments include any measures the PNF believes are needed to minimize or compensate for effects on the species.

Consultation with the US Fish and Wildlife (USFWS) and National Oceanic and Atmospheric Administration (NOAA) Fisheries is required under the ESA and will be completed prior to any decisions made as a result of this analysis. Additional information about USFWS and NOAA Fisheries is provided below under "Other Agencies having Permit or Review Authority."

The Migratory Bird Treaty Act of 1918: The purpose of this Act is to establish an international framework for the protection and conservation of migratory birds. Additional information on the Migratory Bird Treaty Act can be found in the Wildlife Resources section, Chapter 3.

1872 General Mining Law as amended (30 USC 22, *et seq.*): This law allows U.S. citizens the right to locate, explore, and develop mining claims on federal lands, such as National Forests that are open to mineral entry or, if closed to mineral entry, subject to valid existing rights. Additional information is provided in the Minerals and Geology section, Chapter 3.

The Multiple Use Mining Act of July 23, 1955 (30 USC 611, et seq.): The Act requires, among other things, that any unpatented mining claim "…shall not be used, prior to issuance of patent therefore, for any purpose other than prospecting, mining, or processing operations and uses reasonably incident thereto."

The Federal Water Pollution Control Act of 1972 (PL 92-500) as amended in 1977 (PL 95-217) and 1987 (PL 100-4), also known as the federal Clean Water Act: The primary objective of this Act is to restore and maintain the integrity of the nation's waters by: 1) Eliminating the discharge of pollutants into the nation's waters; and 2) Achieving water quality levels that are fishable and swimmable. This Act establishes a non-degradation policy for all federally proposed projects to be accomplished through planning, application, and monitoring of Best Management Practices (BMPs) (see Appendix B). Identification of BMPs is mandated by Section 319 of the Water Quality Act of 1987 (also referred to as the Clean Water Act), which states, "It is national policy that programs for the control of nonpoint sources of pollution be developed and implemented." Additional information on BMPs is provided in Appendix B and the Soil and Water Resources section, Chapter 3.

The Clean Air Act, as amended in 1990: The purposes of this Act are "...to protect and enhance the quality of the Nation's air resources so as to promote the public health and welfare and the productive capacity of its population; to initiate and accelerate a national research and development program to achieve the prevention and control of air pollution; to provide technical and financial assistance to State and local governments in connection with the development and execution of their air pollution prevention and control programs; and to encourage and assist the development and operation of regional air pollution prevention and control programs."

Federal Noxious Weed Act of 1974: This Act provides for the control and management of non-indigenous weeds that injure or have the potential to injure the interests of agriculture and commerce, wildlife resources, or the public health. The Act requires that each federal agency develop a management program to control undesirable plants on federal lands under the agency's jurisdiction; establish and adequately fund the program; implement cooperative agreements with state agencies to coordinate management of undesirable plants on federal lands; establish integrated management systems to control undesirable plants targeted under cooperative agreements.

The Preservation of American Antiquities Act of 1906: This Act makes it illegal to "...appropriate, excavate, injure, or destroy any historic or prehistoric ruin or monument, or any object of antiquity, situated on lands owned by the Government of the United States...". Concurrence has been reached with the Idaho State Historic Preservation Office regarding impacts to cultural resources in the Golden Hand project area.

The National Historic Preservation Act: This Act requires federal agencies to consult with State and local groups before nonrenewable cultural resources, such as archaeological sites and historic structures are damaged or destroyed. Section 106 of this Act requires federal agencies to review the effects that project proposals may have on the cultural resources in the project area. It requires agencies to consider the effects of undertakings on properties eligible to or listed in the National Register of Historic Places by following the regulatory process specified in 36 CFR 800.

Consumers, Civil Rights, Minorities, and Women: All Forest Service actions have potential to produce some form of impacts, positive or negative, on the civil rights of individuals or groups, including minorities and women. The need to conduct an analysis of this potential impact is required by Forest Service Manual and Forest Service Handbook direction (see Chapter 3).

Environmental Justice: On February 11, 1994, President Clinton signed Executive Order 12898. This order directs each federal agency to make environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health

or environmental effects of its programs, policies, and activities on minority populations and low-income populations. The President also signed a memorandum on the same day, emphasizing the need to consider these types of effects during NEPA analysis. To meet this direction, the USDA requires that where proposals have the potential to disproportionately adversely affect minority or low-income populations, these effects must be considered and disclosed (and mitigated to the degree possible) through the NEPA analysis and documentation. Additional information is provided in Chapter 3, Required Disclosures.

Natural or Depletable Resource Requirements and Conservation Potential: The Golden Hand Mine project has been designed to conform to applicable laws and regulations pertaining to natural or depletable resources, including minerals and energy resources. Regulations of mineral and energy activities on the National Forest, under the 1872 General Mining Law and the Mineral Leasing Act of 1920, are shared with the Bureau of Land Management.

Payette National Forest Responsibilities to Federally Recognized Tribes: American Indian Tribes are afforded special rights under various federal statutes that include: the National Historic Preservation Act (NHPA) of 1966 (as amended); the National Forest Management Act of 1976 (P.L.4-588); the Archaeological Resources Protection Act of 1979 and Regulations 43 CFR Part 7; the Native American Graves Protection and Repatriation Act (NAGPRA) of 1990 and Regulations 43 CFR Part 10; the Religious Freedom Restoration Act of 1993 (P.L. 103-141); and the American Indian Religious Freedom Act (AIRFA) of 1978. Federal guidelines direct federal agencies to consult with modern American Indian Tribal representatives who may have concerns about federal actions that may affect religious practices, other traditional cultural uses, as well as cultural resource sites and remains associated with American Indian ancestors. Any tribe whose aboriginal territory occurs within a project area is afforded the opportunity to voice concerns for issues governed by NHPA, NAGPRA, or AIRFA.

Federal responsibilities to consult with Indian Tribes are included in the National Forest Management Act of 1976 (P.L. 4-588), Interior Secretarial Order 3175 of 1993 and Executive Orders 12875, 13007, 12866, and 13084. Executive Order 12875 calls for regular consultation with tribal governments; and Executive Order 13007 requires consultation with Indian Tribes and religious representatives on the access, use, and protection of Indian sacred sites. Executive Order 12866 requires that federal agencies seek views of tribal officials before imposing regulatory requirements that might affect them; and Executive Order 13084 provides direction regarding consultation and coordination with Indian Tribes relative to fee waivers. Another Executive Order that pertains to American Indian Tribes includes Executive Order 12898, which directs federal agencies to focus on the human health and environmental conditions in minority and low-income communities, especially in instances where decisions may adversely impact these populations (see the "Environmental Justice" discussion above). The 40 CFR 1500-1508 regulations of the NEPA invite Indian tribes to participate in Forest management projects and activities that may affect them.

The Golden Hand Mine project area is located within ceded lands of the Nez Perce Tribe. Ceded lands are federal lands on which the federal government recognizes that a tribe has certain inherent rights conferred by treaty. In the Nez Perce Treaty of 1855, Article 3, the United States of America and the Nez Perce Tribe mutually agreed that the Nez Perce retain the right of: "... taking fish at all usual and accustomed places in common with citizens of the Territory [of Idaho]; and of creating temporary buildings for curing, together with the privilege of hunting, gathering roots and berries, and pasturing horses and cattle..."

Other Agencies Having Permit or Review Authority

Idaho State Historic Preservation Office (referred to as SHPO)
Actions that are permitted, approved, or initiated by the Forest Service and that may affect cultural resources must comply with provisions of the National Historic Preservation Act (NHPA) of 1966, as amended, and as implemented by federal guidelines 36 CFR 800. Section 106 of the NHPA requires a federal agency to take into account the effects of the agency's undertaking on properties listed on, or eligible for listing on, the National Register of Historic Places (NRHP). Before any federal undertaking begins, cultural resources eligible for listing on the NRHP must be identified and documented. Cultural resources recorded in the project area are evaluated in consultation with SHPO or the Federal Advisory Council on Historic Preservation (ACHP). Additional information regarding consultation and the documentation of the site is available in the Cultural Resources section, Chapter 3.

U.S. Fish and Wildlife Service (USFWS) and National Oceanic and Atmospheric Association (NOAA) Fisheries
The USFWS has responsibilities under the Fish and Wildlife Coordination Act (1934), Endangered Species Act (1973), and Bald Eagle Protection Act (1940). Responsibilities under the Fish and Wildlife Coordination Act require federal agencies issuing permits (i.e. Corps of Engineers § 404 Permit) to consult with the USFWS to prevent the loss of or damage to fish and wildlife resources where "waters of any stream or other body of water are proposed...to be impounded, diverted...or otherwise controlled or modified."

The NOAA-Fisheries is the federal agency responsible for the stewardship of the nation's living marine resources and their habitat. The public trust responsibility is derived from numerous laws, primary of which are the Magnuson-Stevens Fishery Conservation and Management Act, Marine Mammal Protection Act, and the Endangered Species Act (ESA).

The Forest Service must prepare a biological assessment (BA) to comply with the ESA. A BA evaluates potential effects on threatened and endangered species that may be present in the project area. The USFWS and NOAA-Fisheries decide if implementation of the selected alternative would jeopardize the continued existence of any species listed or proposed as threatened or endangered under the ESA. This decision is issued as a Biological Opinion (BO). The BO includes terms and conditions that must be complied with in order to be exempt from the prohibitions of Article 9 of that Act. The BO may include conservation recommendations, which are suggestions regarding discretionary activities to minimize or avoid adverse effects of the proposed action on listed species or critical habitat. If it is determined that the alternative would jeopardize the continued existence of a species, the agency must offer a reasonable and prudent alternative that would, if implemented, preclude jeopardy. The USFWS and NOAA-Fisheries have 60 days from initiation of formal consultation to issue a BO. If the USFWS and NOAA - Fisheries decide that implementation would not jeopardize the continued existence of any listed species, a letter of concurrence will be issued after a 30-day informal consultation period. Additional information is provided in the Fish Populations and Habitat section, Chapter 3.

U.S. Army Corps of Engineers (COE)
COE is the permitting authority for the discharge of dredged or fill materials into the wetlands and non-wetland waters of the United States. Any activities that would result in disposal of dredged or fill materials into wetlands and non-wetland waters of the U.S. would require a "404 permit" under Section 404 of the Clean Water Act (see Table I-1). Additional information is provided in the Soil and Water Resources section, Chapter 3.

U.S. Environmental Protection Agency (EPA)

The EPA has oversight responsibility for federal Clean Water Act programs delegated to and administered by the Department of Environmental Quality. EPA may also intervene to resolve interstate disputes where discharges of pollutants in an upstream state may affect water quality in a downstream state. EPA also reviews 404 dredge and fill permit applications and provides comments to the COE. The EPA has veto authority under the federal Clean Water Act for decisions made by the COE on 404 permit applications. EPA also has responsibilities under NEPA and the federal Clean Air Act to cooperate in the preparation of EISs and to review draft EISs and federal actions potentially affecting the quality of the environment. EPA advises the lead agencies on the preparation of an EIS and evaluates the adequacy of information in the EIS, the overall environmental impact of the proposed action, and various alternatives.

Idaho Department of Water Resources (IDWR)

IDWR administers water rights in the State of Idaho. Compliance with state requirements for protection of waters within Idaho (Idaho Administrative Code IDAPA 58.01.02) means "The existing instream water uses and the level of water quality necessary to protect the existing uses shall be maintained and protected"; and, "...wherever attainable, surface waters of the state shall be protected for beneficial uses, which for surface waters includes all recreational use in and on the water surface, and the preservation and propagation of desirable species of aquatic life."

Idaho Department of Environmental Quality (IDEQ)

The IDEQ is responsible for implementing environmental protection laws and programs for the state of Idaho. IDEQ administers water quality monitoring for compliance with Idaho water quality standards and is the issuing agency for waivers needed for short-term increases in surface water turbidity during construction.

CHAPTER 2. ALTERNATIVES

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CHAPTER 2
ALTERNATIVES

Introduction

This chapter describes and compares the alternatives considered for the project and summarizes how the alternatives meet the Purpose and Need and address the issues presented in Chapter 1. The alternatives represent a range of possible actions determined by the major issues, the Purpose and Need, Payette National Forest Land Management Plan (Forest Plan) and Frank Church-River of No Return (FC-RONR) Wilderness Management Plan direction, and federal and state laws and regulations. A range of reasonable alternatives was developed by the Interdisciplinary Team (ID Team), including alternatives considered in detail and alternatives considered but eliminated from further analysis.

Alternatives Considered in Detail

The Forest Service developed three alternatives (including "No Action") that were considered in detail along with the proponent's proposed plan. The Forest Service alternatives were developed in response to AIMM's proposed plan of operations using issues raised by the public, Forest Service specialists, Tribal Governments, and other agencies and organizations.

The analysis of alternatives was based on maps provided by AIMM. The PNF refined these maps with field surveys using a Global Positioning System (GPS) and displayed the results in a Geographic Information System (GIS). Field surveys discovered one claim corner common to Golden Hand claims No's. 3 and 4 and unnamed claim corners that did not correspond with the claim corner locations depicted in AIMM's maps. Due to this conflicting information, the Forest Service created two maps of Golden Hand No's. 3 and 4 lode mining claims (Project Record). AIMM selected the map they believed was the most accurate for the purposes of the environmental analysis; this map was used to form the maps for the different alternatives (see Figures 2-1, 2-2, and 2-3). Although locations and distance estimates are approximate, the selected map provides the necessary information for comparing the relative effects of the alternatives. The selected map also provides more refined estimates of the amount of road construction than the numbers provided by AIMM in their documents.

Prior to approval by the Forest Service of an operating plan, AIMM would need to physically locate and identify the corner monuments of these claims for approval by the Forest Service. In addition, locations of roads, trenches, drill pads and other surface disturbing activities would be physically identified and reviewed to ensure that they are on the claims or necessary for access to the claims before any surface disturbance occurs.

Alternative A – No Action

The National Environmental Policy Act (NEPA) requires consideration of a "No Action" alternative. However, under Forest Service mining regulations at Title 36 Code of Federal Regulations (CFR) 228 Subpart A, this option can only be considered as an intermediate step in

processing a plan of operation, provided that it has been properly submitted under the authority of the U.S. Mining Laws. For example, some proposed plans or parts of proposed plans of operation may not represent logical and sequential development of mineral property, may not be feasible, may not comply with applicable state or federal laws, or may not be reasonably incident to mining. In such cases, the Forest Service may not simply deny approval of the plan, but has the obligation to notify the operator as required under 36 CFR 228.5, of changes to be made that are necessary for its approval. Ultimately, in accordance with law and regulation, holders of valid mining claims have a legal right to develop their claims and a reasonable plan of operations must be identified and approved.

Alternative B – The Proposed Plan

This alternative is American Independence Mine and Minerals, Inc. (AIMM) proposed plan of operations (operating plan or plan) for the Golden Hand No.3 and No. 4 lode mining claims. The proposed plan would allow for mineral development of the mining claims located on the Krassel Ranger District, Payette National Forest, in the Frank Church River of No Return (FC-RONR) Wilderness. The claims encompass approximately 20 acres each and are located near Coin Creek, a tributary of Beaver Creek, which flows into Big Creek, a tributary of the Middle Fork Salmon River. The majority of the proposed operations would occur on the claims (Figure 2-1). The project area includes the claims, mill site where samples would be transported, and the connecting roads and access routes between the claims and the mill site (Figure 1-2).

The proposed plan was described in the following documents provided by AIMM to the Forest Service beginning in 1996 and continuing with letters of clarification through December 2002:

- Proposed plan of operations received April 14, 1996 from Richard Ross acting for AIMM
- Letter received from David Lombardi representing AIMM on August 30, 2000
- Letter received from Conway Ivy dated September 14, 2002 (Ivy 2002a)
- Letter received from Conway Ivy dated December 7, 2002 (Ivy 2002b)
- Letter received from Conway Ivy dated December 13, 2002 (Ivy 2002c)

The Forest Service made no modifications to AIMM's description of the proposed plan. In the description below, statements copied verbatim from AIMM's proposal are presented in quotes. Actions that could reasonably be expected based on the proposal (i.e., removal of up to 170 trees during roadwork) are described in italics. Because the proposed plan does not meet several Forest Plan requirements, a number of one time, site specific, non-significant amendments to the Forest Plan would be necessary. These are described below.

The following bullets statements provide a summary of AIMM's proposed operating plan. Under the proposed plan AIMM would:

- Maintain and widen portions of Forest Roads (FR) 371 and 373 between the Big Creek Trailhead and Pueblo Summit.

- Construct approximately 4 miles of road in the FC-RONR Wilderness with 0.8 miles constructed on claims. Most roads (3.5 miles) would occur on abandoned roadbeds.

- Develop 31 drill site locations (with a total of 48 drill holes, each up to 500 feet deep).

- Excavate 5 trenches (5 feet wide by 5 feet deep totaling approximately 750 feet in length).
- Conduct underground work (clearing out, drilling, and possibly ore extraction) at two existing mine openings (adits).
- Place waste rock a minimum of 150 feet from intermittent or perennial stream channels on existing waste dumps at the mine site.
- Use a variety of vehicles and equipment including pickup trucks, a tandem drive flatbed truck, drill rig, dump truck, backhoe/loader, bulldozer, road grader, compressor, saws, underground mining machinery, and generator.
- Haul a maximum of 10 dump truck loads of the extracted ore 12 miles to the Walker Millsite for bulk metallurgical testing using a 14-yard tandem-axle truck.
- Store fuel and explosives on or near the claims.
- Cut some trees on site to remove hazard trees and clear roads, and use the trees for mine timbers and firewood.
- Use a structure near the claims to house a six-person crew.
- Obtain water from a creek for mining operations (limited to 2500 gallons per day [GPD]), and domestic purposes (limited to 13,000 GPD).
- Conduct development activities from early summer through fall over a 10-year period.
- Conduct reclamation activities at the end of each season and at the end of the proposed operations.

A detailed description of AIMM's proposed plan is provided below.

Access, Road Maintenance and Construction

Access to the claims would be on Forest Roads (FR) 371 and 373 to the FC-RONR Wilderness boundary at Pueblo Summit, north of Edwardsburg. AIMM's proposed maintenance along these roads would include clearing loose rock, downed trees, and other obstacles to maintain a safe width for equipment transport, defined by AIMM as a "minimum of 10 foot widths on the straight a ways and slightly wider on the turns." AIMM states "the drill rigs we indicated in our Plan are compatible with the original road widths...switchbacks can accommodate these larger vehicles which can be moved to their drilling objective by backing and advancing on the switchbacks."

Based on the size of AIMM's proposed equipment it is likely the roads would be widened to 12 feet in width resulting in the removal of a maximum estimated 170 trees.

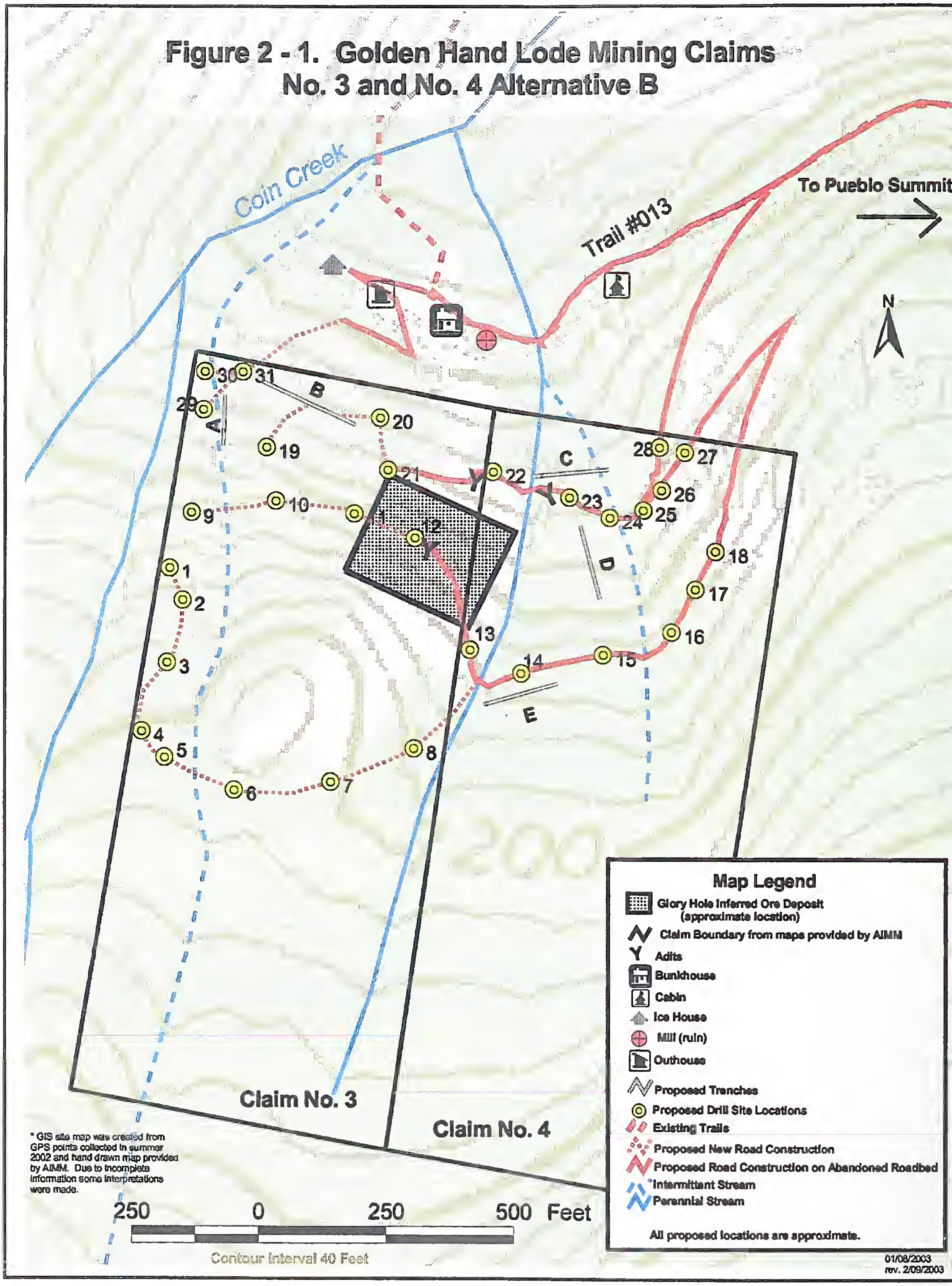

Figure 2 - 1. Golden Hand Lode Mining Claims No. 3 and No. 4 Alternative B

Within the FC-RONR Wilderness, AIMM proposes to construct approximately 4.0 miles of road. Most of the road (about 3.5 miles) would be constructed on abandoned roadbeds. The old roadbeds were not, in recent history, part of the PNF classified road system. Work on these roadbeds cannot be considered "road reconstruction" because this activity must occur on an "existing classified road" (USDA 2002). About 2.9 miles of this road construction would occur on Forest Service Trail #013, which is currently a foot and packstock trail. Table 2-1 displays the amount of proposed road construction.

Table 2-1. Proposed Road Construction in the FC-RONR Wilderness for the Golden Hand Mine Project under Alternative B.

	Road construction-old roadbeds		New road construction	
	Off claim	**On claim**	**Off claim**	**On claim**
Road lengths	16,440 feet (3.11 miles)	2,090 feet (0.40 miles)	370 feet (0.07 miles)	2,200 feet (0.42 miles)

On all roads, fill material would be used to smooth out rocky sections and encroaching vegetation would be removed. Any construction material needed for roadwork would be taken from the existing roadbed and bank. Water bars would be constructed to direct water off the road and into vegetated areas. Where appropriate, existing drain gullies on the road would be repaired to direct runoff away from streams. AIMM has stated if determined "necessary for resource protection" the stream crossings would be armored with rocks.

Development Work

Locations of trenches and drill sites were approximated using maps and descriptions provided by AIMM (see Figure 2-1). Constructed roads would be used to access 31 drill sites (with 48 drill holes) and 5 trench locations. Approximately 750 feet of trench (5 feet wide and 5 feet deep) would be excavated. "Production development work would also be conducted underground at existing mine openings (adits). This work would consist of cleaning out adits, drilling, and possibly ore extraction." Waste rock would be placed a minimum of 150 feet from perennial and intermittent streams on existing waste dumps at the mine site.

Extracted ore would be hauled approximately 12 miles to the Walker Millsite near the community of Edwardsburg for bulk metallurgical testing. A maximum of 10 dump truck loads of material would be removed for testing during the proposed 10-year operating period.

Vehicles and Equipment

Vehicles would include pickup trucks, a tandem drive flatbed truck, drill rig, haul truck, fourteen-yard tandem-axle ore truck, and a dump truck. Equipment proposed for use in the mining operation would include a "John Deere 450 backhoe/loader, bulldozer in the size range of a Cat D7 or smaller, Austin Western road grader (99h), compressor (600 CFM or less), saws, underground mining machinery, generator, and hand tools." Drill rigs would consist of smaller truck or track-mounted core or reverse circulation types. In addition, AIMM has asked for "Any other equipment unforeseen at this time which becomes necessary to carry out the activities identified in the April 96 Operating Plan." Pickup truck or sport utility vehicle traffic would be an "average of 2 trips per day over the working season." AIMM anticipates "one round trip per operating season for the bulldozer, backhoe, road grader, drill, and compressor." Up to ten total dump truck trips would be required to transport the ore samples.

Hazardous Materials

Fuel would "normally be transported in quantities not over 250 gallons in sealed tank or barrel containers on a pickup or one of the in going trucks" and stored in a leak proof container away from streams. Fire extinguishers would be kept on hand. To mitigate any accidental fuel spills, the operator proposes to spread any contaminated soil thinly and "agitate" it to allow the fuel to evaporate (volatilize). The contaminated soil would then be burned.

Explosives would be transported in certified, licensed, and insured vehicles, and would be stored in the existing powder house (which may be updated) and/or portable magazines may be brought onto the site.

Timbers

Timbers would "be hauled in from outside the Wilderness ordinarily." Timbers cut on the claims would be cut out of sight of the trails to reduce visual impact except when a tree poses a hazard along the trail or road. Trees cut in the construction of spur roads would be used as firewood or mine timbers.

Work Crew and Housing

The work crew would include approximately 6 people. Larger crews may be necessary at times. AIMM proposes to house the work crew in the existing bunkhouse. AIMM proposes general cleaning, replacement of broken windows, repair of the cook stove, and "eventually" enhancement of the foundation in order to secure the bunkhouse's longer-term viability. AIMM proposes to preserve the living quarters, powder magazines, and other buildings in an upright and usable condition. The existing outhouse would be used for human waste, and domestic water would be hauled to a landfill dump or transfer station. Garbage and refuse would be burned on site, and unburnable material would be hauled to a landfill.

Water

Water would be conducted to the camp and work sites through plastic pipe laid on the ground, with the end of the pipe placed in the creek. No ditches or creek dams are anticipated. AIMM believes the Golden Hand Mine may acquire the following domestic water rights exempt from permitting and filing requirements: "(1) a right for mining operations, limited to 2500 gallons per day (GPD) and a diversion rate of .04 cubic feet per second (CFS) per day; and (2) a right for all mine worker lodging and related domestic water uses, limited to 13,000 GPD…the 2500 GPD right for mining, which would include drilling," would "not be used each day."

Based on AIMM's request, two scenarios for water use would be evaluated under this alternative:

1. Taking of the maximum amount of water for mining and domestic purposes (2500 plus 13,000 GPD).
2. Taking the amount of water based on 60 days drilling and the amount necessary to support 6 to 8 people's domestic use, which would be considerably less than the quantities indicated above.

Timing and Duration

AIMM proposes to drill for "60 days or less each operating season and for a period of up to 10 years, beginning when all necessary approvals are in place." "It would take approximately 10 years to execute the 1996 Operating Plan using the most likely annual work season…activity at the Golden Hand would be within a time window of 4 months or 1/3 of a year...a most likely case would be operations between early July and mid-September before hunting season starts."

Reclamation and Bonding

AIMM proposes seasonal reclamation and reclamation at the end of the proposed operations (close out). Reclamation at the end of each operating season would include placement of water bars on claim roads and seeding of cut and fill slopes as needed. Reclamation at close out would include closing roads not used as trails with 12-inch high water bars and seeding to grass (adjacent trees would reseed naturally). Waste dumps would be recontoured if needed to provide stability. Mine portals would be caved and otherwise closed and seeded to grass as needed. Equipment, machinery, tools, and supplies brought in for current mining operations would be hauled out of the Wilderness area. Buildings would be torn down for salvage and/or burned.

AIMM proposes to divert an "existing bond filed with Payette National Forest by AIMM covering its operations at the Antimony Rainbow mine" to cover bonding for the Golden Hand operation.

Under Forest Service Mining Regulations at 36 CFR 228 Subpart A, reclamation bonds that are required must be posted with the Forest Service prior to approval of the plan of operation.

Monitoring

No monitoring was proposed by AIMM, but monitoring of the operation by Forest Service Mineral Specialists would be necessary. Additional monitoring that may be considered necessary in order to implement Alternative B is included in Alternatives C and D.

Forest Plan Amendments

Alternative B would require several amendments to the Forest Plan. These amendments would be one time, site specific, non-significant amendments that would not change overall Forest Plan goals, objectives, Desired Future Conditions, or associated outputs. Alternative B would:

- Amend Management Area 26 (FC–RONR Wilderness) standards and guidelines (p. IV-351), Visual Resource Inventory and Planning, as follows: "For the Golden Hand Plan Of Operations Project, allow activities within the project area of approximately 55 acres that would not meet the Visual Quality Objective of Preservation."

- Amend Forest Plan standards and guidelines (p. IV-71 to IV-75), Water Quality and Soil Productivity to allow ground-disturbing activities that would not apply best Management Practices (BMPs) as described for Soil and Water Conservation Practices.

- Amend Forest Plan standards and guidelines (p. IV-96), Riparian Areas, to allow mechanical disturbance to take place inside the Stream Protection Zones.

- Amend Forest Plan standards and guidelines (p. IV-116), Facilities, to allow reconstruction, remodeling, and maintenance of historic Government owned buildings that would not meet standards specified in the "Secretary of the Interior's Standards for Rehabilitation of Historic Buildings."

- Amend Forest Plan standards and guidelines (p. IV-44), Noxious and Poisonous Weeds, to allow for activities that increase the spread of noxious weeds found in the project area.

- Amend Forest Plan standards and guidelines, as amended by PACFISH, to allow for activities that do not meet PACFISH direction for Riparian Management Objectives, Riparian Habitat Conservation Areas, and minerals and road management.

- Amend Forest Plan standards and guidelines (p. IV-351) that incorporate direction from the Frank Church River of No Return Wilderness Management Plan (1985, as amended), to allow for activities that do not meet Wilderness Plan direction.

- Amend Forest Plan standards and guidelines (p. IV-99), Minerals Management, to allow for activities that do not minimize unnecessary impacts to surface resources through inclusion of reasonable environmental protection measures in the operating plan.

- Amend Forest Plan standards and guidelines (p. IV-100), Minerals Management, to allow for activities that do not employ all practicable measures to maintain and protect fisheries habitat, which may be affected by the operations.

- Amend Forest Plan standards and guidelines (p. IV-101), Minerals Management, to allow for activities that do not construct and maintain mining development roads to assure adequate drainage and to minimize or, where practicable, eliminate damage to soil, water, and other resource values.

- Amend Forest Plan standards and guidelines (p. IV-101), Minerals Management, to allow for activities that do not reclaim mining development roads by shaping the surface to as near natural contour as practicable.

- Amend Forest Plan standards and guidelines (p. IV-101), Minerals Management, to allow for activities that do not provide for permanent acceptable ground cover with species that contribute to species diversity, are non-noxious, and are approved by the Forest Service.

Alternative C – Proposal Modified for Resource Protection

This alternative modifies the proposed plan of operations for the Golden Hand No. 3 and No. 4 lode mining claims to ensure that National Forest System lands, including those under mining claim locations, are used only for purposes required for and reasonably incident to mining and in a manner that minimizes adverse environmental impacts. Based on the information provided in the Surface Use Analysis (Abbay 2003, Appendix B), the modified alternative is considered viable because it provides the opportunity for AIMM to achieve it's stated goals while minimizing impacts to the environment. This alternative would allow most of AIMM's proposed development activities using a sequenced implementation schedule starting in the area of the inferred ore deposit (Figure 2-2).

This alternative responds to **fisheries** and **water quality issues** with modifications that remove trenching, limit vehicle and equipment size, restrict road construction and drilling in RHCAs, and add road maintenance such as installation of culverts, dips, gravel, and a log stringer bridge. No residential occupancy is allowed. Some **wilderness** issues were addressed, but only in part, by requiring the operators to live off-site, limiting the timing and duration of the operations, and by prohibiting cutting of trees except to clear roadbeds in the Wilderness.

This alternative allows vehicle access to the claims on Forest roads outside the Wilderness and on abandoned roadbeds in the Wilderness. The total road construction in the Wilderness is reduced to 3.4 miles. AIMM's proposed development scenario including road construction and drilling at up to 31 drill locations could occur on the claims with the following primary modifications:

- Vehicles would be restricted to a tire tread width less than seven feet and equipment would be restricted to a track width less than eight feet.
- Roadbeds would not be widened; slough and vegetation on roadbeds would be removed.
- Additional road maintenance would include installation of culverts, dips, gravel, and a bridge at stream channel crossings and where needed for road drainage.
- All activities would include the use of Best Management Practices (BMPs).
- Most roads would be constructed on old roadbeds.
- Road construction off roadbeds must occur outside of RHCAs.
- Drill locations off roadbeds would be outside specified stream buffers and would include mitigation measures.
- Drilling would be sequenced beginning in the area of the inferred ore deposit.
- Drilling data from each season would be shared with the PNF prior to approval of next season's work.
- Trenching would not be authorized.
- Underground work (clearing out, drilling, and possibly ore extraction) would be conducted at two existing mine openings (adits).

- Vehicle access to the mining claims would eliminate the need for residential occupancy onsite.

Access and Road Maintenance

Access to the claims would be on Forest Roads (FR) 371 and 373 to the FC-RONR Wilderness boundary at Pueblo Summit. The Forest Service engineer determined that more extensive roadwork would be necessary than proposed under Alternative B to safely accommodate the proponent's proposed equipment. To avoid this more extensive roadwork, road maintenance would be limited to clearing of slough on the existing roads. Roadbeds would not be widened, but switchbacks would need to be widened to accommodate some vehicles and equipment (such as an articulated ore truck - see Table 2-2). Vehicles and equipment would be restricted to a tire tread width less than seven feet and a track width less than eight feet, respectively. Stream crossings would be improved and the roadbed would be maintained using BMPs (see Appendix D). Any construction material (e.g., fill, gravel) needed for road improvements would be taken from a source developed at the Werdenhoff Mine site, outside of RHCAs. A list of road maintenance activities is provided in Tables 2-2 and 2-3. These activities would be implemented prior to AIMM commencing mining work on the claims.

Access management in the Wilderness would include the following measures. The trailhead gate at Pueblo Summit would be upgraded and locked. Boulders would be placed near the trailhead to block access around the gate. AIMM's vehicles would be assigned a permit number to display on the dashboard. Only AIMM vehicles with an assigned permit would be allowed access to the site. Access would be limited to two round trips per day. No other vehicles (Forest Service or private) would be allowed within the Wilderness.

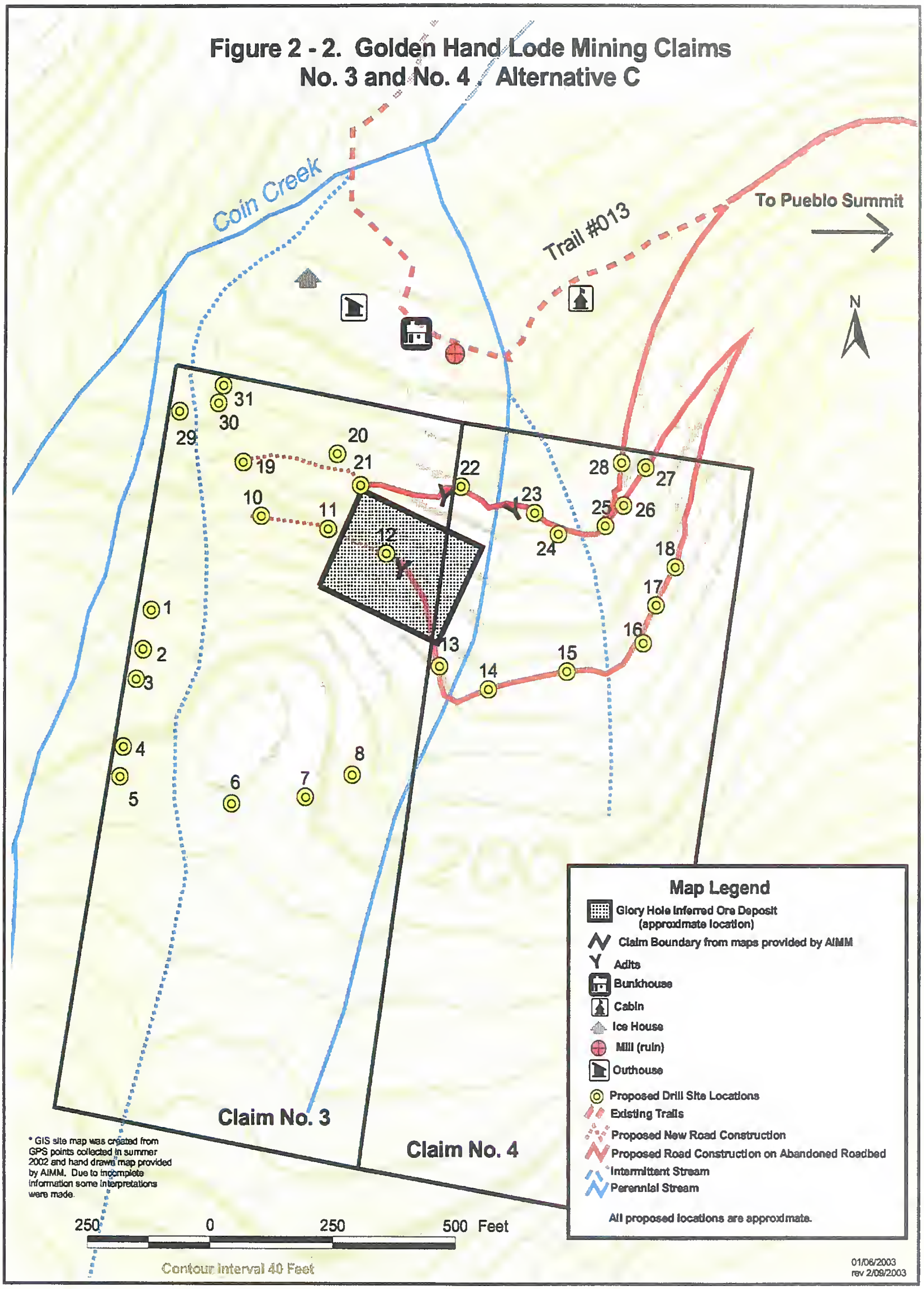
Figure 2 - 2. Golden Hand Lode Mining Claims
No. 3 and No. 4 , Alternative C
Coin Creek
Trail #013
To Pueblo Summit
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24
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Claim No. 3
Claim No. 4
Map Legend
Glory Hole Inferred Ore Deposit (approximate location)
Claim Boundary from maps provided by AIMM
Adits
Bunkhouse
Cabin
Ice House
Mill (ruin)
Outhouse
Proposed Drill Site Locations
Existing Trails
Proposed New Road Construction
Proposed Road Construction on Abandoned Roadbed
Intermittent Stream
Perennial Stream
All proposed locations are approximate.
* GIS site map was created from GPS points collected in summer 2002 and hand drawn map provided by AIMM. Due to incomplete information some interpretations were made.
250
0
250
500 Feet
Contour Interval 40 Feet
01/06/2003
rev 2/09/2003

Table 2-2. Proposed Road Maintenance Activities for FR 373 (Pueblo Summit Road) under Alternatives C and D.

Miles from summit	Maintenance Activity
0.1-0.6	Install drivable dips about every tenth of a mile[a]
0.7	Stream crossing: install 24" x 24' corrugated metal pipe (cmp), armor roadbed on both sides of crossing with 10 yds^3 aggregate.
0.8-1.6	Install drivable dips about every tenth of a mile[a]
1.05	Switchback: 20 ft. radius, 14 ft. road width, 16% grade; widen to 25 ft. radius[c]
1.15	Switchback: 20 ft. radius, 16 ft. road width, 16% grade; widen to 25 ft. radius[c]
1.45	Wet area: install 50 feet of inside ditch, 18" x 24' cmp cross drain, 20 yds^3 aggregate[b]
1.55	Stream crossing: install 49" x 33" pipe arch 24' long with armored outlet, add 20-yds^3 aggregate[b] to the approaches to prevent stream sedimentation.
2.3	Install drivable dip
2.4	Wet area in road: install 30 ft of inside ditch and 18" x 24' long cmp with armored outlet apron and 20-yds3 aggregate[b].
2.45	Switchback: 20 ft. radius, 14 ft. road width, 14% grade; Widen to 25 ft radius[c]
2.5	Install 18" x 24' cmp, armor outlet with 10 yds^3 aggregate[b].
2.6	Install drivable dip.
2.65	Install drivable dip.
2.7	Stream crossing: install armored ford and 10-yds3 aggregate[b] on approaches.
2.8	Install drivable dip.
2.85	Stream crossing: install 24" by 24' cmp with armored outlet and 10-yds3 aggregate[b] on approaches.
2.8 – 3.0	Werdenhoff and Velvet Quartz mining areas. The waste dump at the mouth of the Werdenhoff Mine adit is a good source for coarse, well-graded aggregate.
3.0	Install armored drivable dip with 10 yds^3 aggregate[b]
3.05	Install a 20' span native timber bridge across N.F. Smith Creek and 30" x 24' cmp on smaller stream. Use Douglas fir for bridge stringers (available along FR 373, see Figure 1-2). Build up approaches for clearance of the log stringers and cover over cmp. Use logs for cribbing for bridge abutments. Redirect smaller stream.
3.2-3.7	Install drivable dips about every tenth of a mile.
3.8	Junction with FR 371 and FR 373

[a] Dips should be placed on the relatively flatter sections of the road and should direct water into vegetated areas away from streams to act as sediment buffers. Where appropriate, existing drainage gullies on the road sites would be repaired to direct runoff away from streams. Many dips on this section of road would require lead off ditches due to the trough-like nature of the road.

[b] Aggregate should be coarse & well graded. Construction material needed for road improvements would be taken from the waste rock dump at the Werdenhoff Mine.

[c] Switchback widening would allow for use of narrow width articulated dump trucks.

Table 2-3. Proposed Road Maintenance Activities for FR 371 (Smith Creek Road) under Alternatives C and D

Miles from summit	Maintenance Activity
3.9	Wet area in the road: install dip plus 20 yds^3 aggregate[b]
4.0	Install drivable dip.
4.05	Wet area in the road: install dip plus 10 yds^3 aggregate[b]

Miles from summit	Maintenance Activity
4.1	Install dip plus 10 yds^3 aggregate[b]
4.15	Install dip plus 10 yds^3 aggregate[b]
4.2	Install dip plus 10 yds^3 aggregate[b]
4.25	Overflow stream crossing: install dip plus 30 yds^3 aggregate[b]
4.3	Ford of North Fork of Smith Creek: Install geo-grid fabric (plastic honeycomb) and fill with gravel to prevent widening of the stream due to traffic.
4.35	Install dip and 30-yds3 aggregate[b] between the dip and the ford.
4.4-6.3	Numerous mud holes during wet weather, place 10-yds3 aggregate[b] in 19 sites and make armored dips.

[a] Dips should be placed on the relatively flatter sections of the road and should direct water into vegetated areas away from streams to act as sediment buffers. Where appropriate, existing drainage gullies on the road sites would be repaired to direct runoff away from streams. Many dips on this section of road would require lead off ditches due to the trough-like nature of the road.

[b] Aggregate should be coarse & well graded. Construction material needed for road improvements would be taken from the waste rock dump at the Werdenhoff Mine.

Road Construction

This alternative would allow the construction of approximately 3.4 miles of road in the Wilderness. Most of the road (about 3.3 miles) would be constructed on abandoned roadbeds. The old roadbeds were not, in recent history, part of the PNF classified road system. Work on these roadbeds cannot be considered "road reconstruction" because this activity must occur on an "existing classified road" (USDA 2002). Most of this work would be classified as "light construction" (i.e., vegetation, down logs, and slough removal) with no widening beyond the original roadbed width of 10 feet.

About 2.7 miles of this road construction would occur on FS Trail #013. No blading or excavation would occur on existing roadbeds when approaching and crossing fords for a distance of 25 feet on either side of the stream. Vegetation in these areas would be removed by cutting with chainsaws or by hand rather than uprooting. Table 2-3 displays the amount of proposed road construction.

Table 2-3. Proposed Road Construction in the FC-RONR Wilderness for the Golden Hand Mine Project under Alternative C.

	Road construction-old roadbeds		New road construction	
	Off claim	**On claim**	**Off claim**	**On claim**
Distances	15,400 feet (2.9 miles)	2,090 feet (0.4 miles)	0 feet	550 feet (0.1 miles)

New road construction off of old roadbeds would occur outside of RHCAs on all slopes and outside of soil saturations zones when slopes are greater than 35 percent. New roads would be limited to 10 feet in width. Road routes, design, and erosion control measures would be approved by the Forest Service and must comply with Forest Service Soil and Water Conservation Practices (FSH 2509.22), State of Idaho mining BMPs, and practices listed in the Biological Assessment for ongoing actions in the Middle Fork Salmon River watersheds (Wagoner and Burns 2001) (see Appendix D).

Development Work

Nearly all of AIMM's proposed plan would be approved including road construction, underground mining from existing mine openings (adits), and drilling of a maximum of 31 drill sites (with up to 48 holes). The bulk samples obtained from the drilling and the underground mining would be limited to 10 truckloads over the duration of the operation (see Vehicles and Equipment). On roadbeds, drill sites may be located within RHCAs but at least 50 feet from live water, and vehicle mounted drill rigs may be used. Off roadbeds, drill sites may be located within RHCAs (where found to be necessary and approved by the Forest Service), but at least 50 feet from live water. Manually portable drill rigs must be used off the roadbeds, and where applicable, mounted on wooden platforms. All work would use Best Management Practices (BMPs) and other mitigation measures (see Appendix D). The Forest Service would approve the additives used for drilling. The underground mining would consist of cleaning out adits, drilling, and possibly ore extraction. Waste rock would be placed outside the RHCA buffers on existing waste dumps at the mine site.

Drilling progress would be monitored and sample assay results shared with the Forest Service to allow for productive discussions on further activities that would be reasonably incident to mining. All information would be considered proprietary.

Vehicles and Equipment

Vehicles used in the operations would include pickup trucks, tandem drive flatbed truck, drill rig, haul truck, and dump truck. Other motorized vehicles not incident to mining, including ATVs, motorcycles, or snowmobiles would not be approved for use in the Wilderness. General transport would be restricted to two vehicle trips per day (except for emergencies). All vehicles would be restricted to existing and constructed roads and all vehicles and equipment would be parked on the claims or outside of the Wilderness boundary. Vehicle parking at Pueblo Summit would be in designated areas. No other vehicles (Forest Service or private) would be allowed within the Wilderness.

Heavy equipment authorized for use in the mining operation would include a rubber-tired backhoe/loader, bulldozer, excavator, and grader. Both the bulldozer and grader would be restricted to a running blade width of 10 feet or less. Drill rigs would include small truck or track-mounted core or reverse circulation types and packstock or manually portable drills. Other equipment includes a compressor (600 CFM or less), saws, underground mining machinery, generator, and hand tools.

Rubber-tired vehicles must be limited to a tire tread width of less than seven feet. For example, a standard 12 to 14 cubic yard dump truck would exceed this size, but a CAT D250B (or equivalent) articulated truck has a front tire tread width of 6'5", a body length of 18'7" and 15-cubic yard capacity. Less than 10 trips total would be required to transport the ore samples. Track vehicles must be limited to a track width of less than eight feet. Heavy equipment would be limited to one round trip per operating season to the mining claims except for travel and work necessary for road maintenance activities. This work must be pre-approved and supervised by the Forest Service.

Hazardous Materials

Fuel would be transported to the claims in quantities not to exceed 250 gallons in Department of Transportation approved tanks on a pickup or one of the inbound trucks. Any excess fuel must be

removed from the claims in the same manner. Fuel may be stored on the claims in approved containers outside of the RHCAs. Fuel stored outside of vehicles must be placed in a berm containment structure lined with impermeable material. Other hazardous materials (liquid drill fluid additives, anti-freeze) must also be stored in containment if outside of vehicles. Vehicles transporting fuel would be required to carry spill containment equipment and fire extinguishers. In the event of a fuel spill, the fuel would be contained and treated using this equipment. Although a Spill Prevention, Containment, and Countermeasures (SPCC) Plan permit may not be required, spill prevention, control, and cleanup would comply with 40 CFR 112 and a similar document must be prepared.

The administering Forest Service official would approve explosive use on a case-by-case basis. Explosives would be transported in certified, licensed, and insured vehicles in accordance with Bureau of Alcohol, Tobacco, and Firearms regulations. No explosives would be stored within the FC-RONR Wilderness.

Timbers

Trees would be provided from outside the Wilderness to be used for operations (such as mine timbers). The Forest Service would identify and mark trees to be cut (see Figure 2-2). No trees would be cut within RHCAs except when presenting a safety hazard along a road. These trees would be left on site. Tree cutting, except in the construction of new roads or abandoned roadbeds, would not be allowed on the claims in the Wilderness. Any milling or processing of the timber would occur outside the Wilderness.

Work Crew and Housing

The work crew would include approximately 6 people. Larger crews of up to 12 people may work on the site for up to three-day periods. The crew would be restricted to two round trips per day (generally two passenger-sized vehicles traveling into the site in the morning and out of the site at night). A pit toilet (temporary outhouse facility) would be located on the claims and used for daily human waste. Non-human solid and liquid waste would be disposed in approved facilities off Forest.

The work crew would reside outside of the Wilderness and National Forest System lands. It is usual and customary for people working in the Idaho backcountry to travel 1-½ hours to their work site. It is reasonable to expect the crew to reside in Big Creek or Edwardsburg.

Work on the mining claims would begin no earlier than one half hour before sunrise and end no later than one-half hour after sunset to reduce the visual and noise impacts to Wilderness users. No artificial work lighting would be allowed on the claims with the exception of headlamps, flashlights, etc.

Timing and Duration

The Responsible Official determined a reasonable operating period based on AIMM's proposed work was three years. Due to unforeseen circumstances, the Responsible Official could extend the operating plan up to two additional seasons. The operating season would extend from mid-June to mid-October with most work occurring between early July to the middle of September.

Forest Service personnel would review the operations and bond annually to confirm that bonds are adequate and that continued operation is logical and sequential and that planned activities are reasonably incident to mineral development. This review would not trigger a new federal decision unless required as a result of new information about the mineral resource or environmental effects of the operation. Any required bond adjustment would need to be completed prior to the beginning of each operating season. In addition to the above described review, at the end of each operating season the Forest Service would arrange for a certified mineral examiner to inspect sampling activities onsite, independently sample and test mineral exposures, and review the year's sample test results.

Water

AIMM must apply for a water right from the State of Idaho for the use of water associated with the proposed plan of operations. Water use would be for mining purposes only. The amount of water for all uses must be limited to 2,500 gallons per day and 0.04 cubic feet per second (CFS) or less than ten percent of the stream flow, whichever is less.

Any water diversions must occur from an unnamed perennial stream (a tributary to Coin Creek) on claim No. 4, because the Central Idaho Wilderness Act stated that new diversions (defined as off claim diversions) would require presidential approval, which is not accounted for in this analysis. The Forest Service would approve the use of a waterline to be placed in the unnamed stream on claim No. 4. The stream flow would be measured at a point about 375 feet downstream of the confluence of Coin Creek and the unnamed stream that flows through claim No. 4. Monitoring would occur throughout the months of operation. The water diversion rate would be reduced if the flow at the point of measurement dropped below 0.4 CFS in order to maintain a removal of less than 10 percent of the flow. A new sized intake pipe limited to the withdrawal of 10 percent or less of the stream flow would be required to replace the old intake pipe.

Noxious Weed Management

All equipment must be washed immediately before entering the National Forest to remove seeds and other vegetative material that could lead to noxious weeds infestations. All revegetation work would be accomplished with certified weed-free materials (i.e., seed, mulch). Where possible, seed would be collected on site. Forest Service personnel would conduct monitoring before and after reclamation work to identify any noxious weed infestations. The operator would be required to remove or pay for the removal of any noxious weed infestations.

Fire Prevention

The FC-RONR Wilderness Management Plan requires operating plans to include the following direction for fire protection: All internal combustion engines must have fire extinguishers and spark arrestors; caches of hand-tools are required; slash and other flammable debris must be disposed of by burning or removal; use of motorized equipment for fire suppression is restricted (USDA 1985, as amended, p. 45).

Monitoring

Monitoring activities are essential to the ensure protection of the environment. Monitoring activities are outlined in Table 2-5 and described in detail in Appendix F.

Reclamation and Bonding

Under Forest Service Mining Regulations at 36 CFR 228 Subpart A, reclamation bonds that are required must be posted with the Forest Service prior to approval of the plan of operation. The bond amount would include the full cost of reclamation, including administrative costs. The entire bond must be received before operations could begin.

Seasonal reclamation would include removal of all equipment and seeding of all disturbed sites with a certified weed free native seed mix to be specified by the Forest Service. Drill holes constructed during the operating season must be closed and reclaimed at the end of the season.

Final closeout would be conducted prior to completion of operations. The Forest Service would determine vehicles and equipment necessary for reclamation. All remaining drill holes would be closed. Stockpiled topsoil will be applied to disturbed sites to improve success of restoration efforts. Most of the disturbed roads would be fully recontoured using equipment approved in the plan. Forest Service Trail #013 would be partially recontoured to grade leaving an 18-inch wide trail. Waste dumps would be recontoured to provide stability. Mine portals would be caved and otherwise closed and revegetated. The PNF would gate one adit to allow for use by bats. All disturbed areas (recontoured roads, hill slopes, drill sites, waste dumps, etc.) would be seeded with a certified weed-free native seed mix and mulch to be specified by the Forest Service. Vehicles, equipment, tools, and supplies brought in for the approved mining operations would be removed from the FC-RONR Wilderness and National Forest System lands by AIMM. The existing buildings, whether on or off claim, would be documented by a Forest Service cultural resources specialist and left standing. The gravel site at the Werdenhoff Mine would also be reclaimed.

Forest Plan Amendments

Alternative C would require three amendments to the Forest Plan. These are one time, site specific, non-significant amendment that would not change overall Forest Plan goals, objectives, Desired Future Conditions, or associated outputs. Alternative C would:

- Amend Management Area 26 (FC–RONR Wilderness) standards and guidelines (p. IV-351), Visual Resource Inventory and Planning, as follows: "For the Golden Hand Plan Of Operations Project, allow activities within the project area of approximately 55 acres that would not meet the Visual Quality Objective of Preservation."

- Amend Forest Plan standards and guidelines, as amended by PACFISH, to allow for activities that do not meet PACFISH direction for Riparian Management Objectives, Riparian Habitat Conservation Areas, and minerals and road management.

- Amend Forest Plan standards and guidelines that incorporate direction from the Frank Church River of No Return Wilderness Management Plan (1985, as amended), to allow for activities that do not meet Wilderness Plan direction.

Alternative D – Proposal Modified for Increased Resource Protection with Non-motorized Access

This alternative modifies the proposed plan of operations for the Golden Hand No. 3 and No. 4 lode mining claims to ensure that National Forest System lands, including those under mining claim locations, are used only for purposes required for and reasonably incident to mining and in a manner that minimizes adverse environmental impacts (Figure 2-3). This alternative was considered viable based on the information provided in the Surface Use Analysis (Abbay 2003, Appendix B).

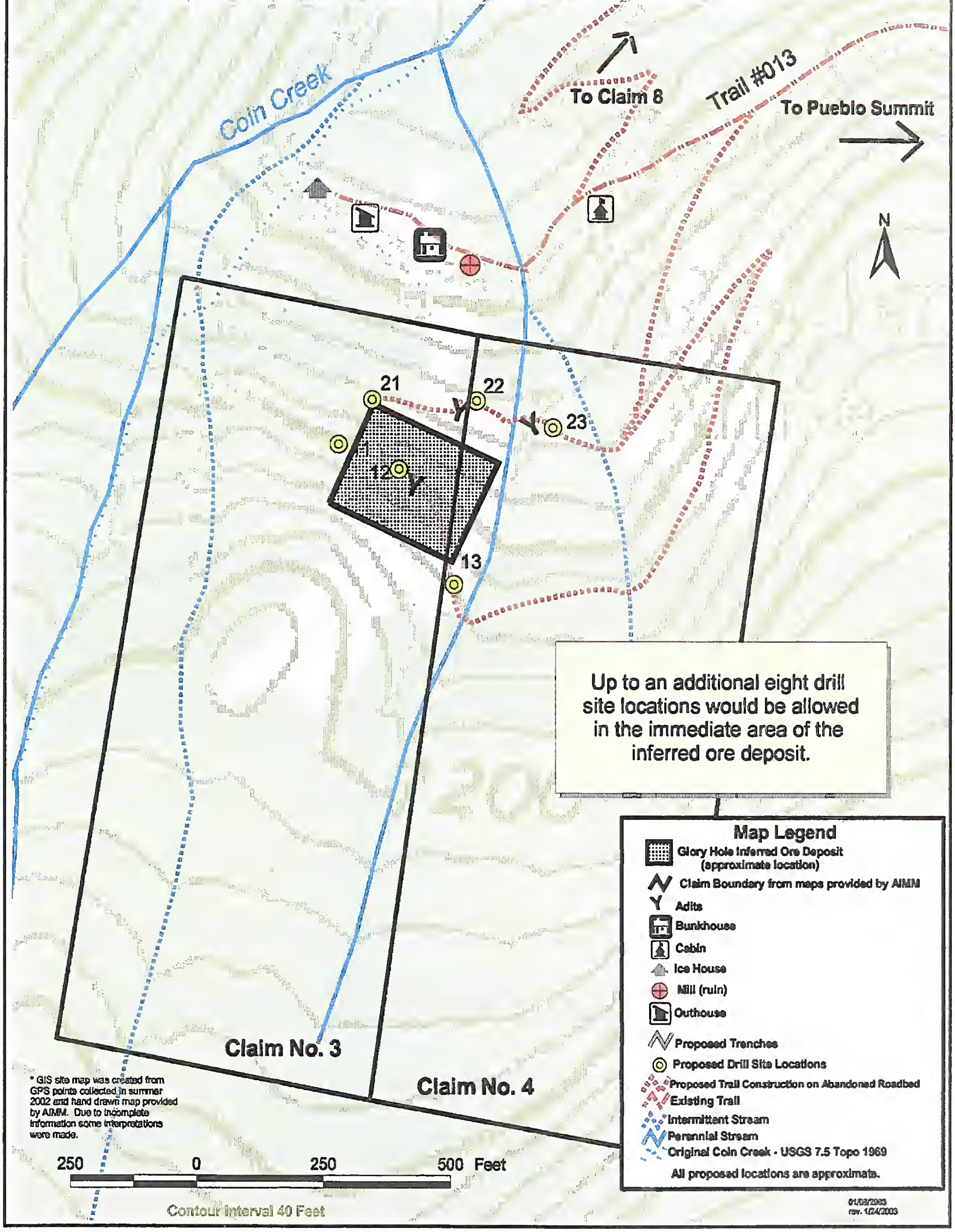
This alternative would approve activities found reasonably incident to mining, at this time. It does not preclude approval in the future of additional activities (such as trenching) that are found reasonably incident following appropriate review, analysis, and documentation.

As with Alternative C, this alternative would require AIMM to start the development work in the area of the inferred ore deposit, but the scope of activities considered under Alternative D would remain focused on drilling in the area of the deposit. This allows Alternative D to better respond to all resource protection issues, particularly the issue of Wilderness protection, because drilling activities would be accomplished without heavy equipment, road construction, and motorized access. This alternative specifically responds to **Wilderness** issues by restricting access to the claims to primitive means. No roads would be constructed and all access in Wilderness would be by foot or packstock. Alternative D also provides greater protection to **fisheries** and **water quality**.

Alternative D includes the same road maintenance and equipment restrictions on FR 371 and 373 as described in Alternative C. Key components of Alternative D include:

- No new road construction, construction on abandoned roadbeds, or trenching.
- All access in Wilderness by primitive means (on foot or with pack stock).
- Use of pack stock or manually portable drills.
- Drill sites would be located on abandoned roadbeds or on platforms more than 50 feet from waterways.
- Drilling activity would be focused around the area of the inferred ore deposit.
- Drilling data from each season would be shared with the PNF prior to approval of next season's work.
- Underground work (clearing out, drilling, and possibly ore extraction) would be conducted at two existing mine openings (adits).
- The operating period would be for three years with extensions up to two years based on unforeseen circumstances.
- Residential occupancy would be allowed on the claims to offset the greater travel times associated with foot travel and pack stock use.

Figure 2 - 3. Golden Hand Lode Mining Claims No. 3 and No. 4 - Alternative D



Access and Road Maintenance

Access to the claims would be on Forest Roads (FR) 371 and 373 to the Wilderness boundary at Pueblo Summit. Access within the Wilderness would be by foot or by packstock on Forest Service Trail #013 to the mine site. All trail clearing in the Wilderness would be done by hand. This alternative maintains the existing roadbed on the FR 371 and 373 including the average road width of approximately 10 feet. Road maintenance on FR 371 and 373 would be the same as described in Tables 2-2 and 2-3 in Alternative C.

Road Construction

No new road construction or construction on abandoned roadbeds would occur.

Development Work

Under this alternative, development work would include drilling and underground mining from existing mine openings (adits). Drilling would be focused in and around the Glory Hole inferred ore deposit. It is expected this would include approximately 14 drill sites. On old roadbeds, drill sites may be located within RHCAs but at least 50 feet from live water. Off of roadbeds, drill sites may be located within RHCAs (where found to be necessary and approved by the Forest Service), but at least 50 feet from live water, and the hand-portable drill rigs must be mounted on wooden platforms, where applicable. All work would use Best Management Practices (BMPs) and mitigation measures (see Appendix D). The drill(s) and associated equipment would be transported manually or using packstock. Only water may be used as a drilling additive. The underground mining would consist of cleaning out adits, drilling, and possibly ore extraction. Any waste rock generated would be transported manually or with pack stock and placed outside the streamside RHCA buffers on existing waste dumps at the mine site.

Drilling progress would be monitored and sample assay results shared with the Forest Service to allow for productive discussions on further activities that would be reasonably incident to mining. All information would be considered proprietary.

Vehicles and Equipment

No vehicle access into the Wilderness would occur. No ATVs, motorcycles, or snowmobiles would be approved for use in the operations. Along FR 371 and 373, all trucks must be limited to a front tread width of less than seven feet. General transport along FR 371 and 373, including transport of ore samples, would be restricted to two passenger vehicle trips per day (except for emergencies). All vehicles would remain outside the Wilderness boundary in designated parking areas.

Under the proposed mining operation, heavy equipment would be approved for road maintenance on FR 371 and 373. This work must be pre-approved and supervised by the Forest Service. All heavy equipment must be limited to a track width of less than eight feet. No heavy equipment would be authorized for use in the Wilderness.

Other equipment must be portable by backpack or pack stock and would include a compressor, saws, underground mining machinery, generator, hand tools, and drills and support equipment. Within the Wilderness, use of all motorized and mechanized equipment would be limited to mining activities.

Hazardous Materials

Outside of the Wilderness, fuel would be transported in quantities not to exceed 250 gallons in Department of Transportation approved tanks on a pickup or one of the inbound trucks to Pueblo Summit. Within the Wilderness, fuel and any other hazardous materials such as liquid drill fluid additives, would be transported by backpack or pack stock and may be stored on the claims outside of RHCAs in approved containers, and placed in a berm containment structure lined with impermeable material. Any method of fuel transportation must include spill containment equipment and fire extinguishers. In the event of a fuel spill, the fuel would be contained using this equipment. Although a Spill Prevention, Containment, and Countermeasures (SPCC) Plan permit may not be required, spill prevention, control, and cleanup should comply with 40 CFR 112.

The administering Forest Service official would approve the use of explosives on a case-by-case basis. Explosives would be transported in certified, licensed, and insured vehicles in accordance with Bureau of Alcohol, Tobacco, and Firearms (BATF) regulations. No explosives would be stored within the FC-RONR Wilderness.

Timbers

Timber cutting on the claims and outside of the RHCAs may be approved for the construction of drill platforms. Trees would be cut by hand and would be identified and marked by the Forest Service.

Work Crew and Housing

The work crew would include approximately 6 people. Larger crews of up to 12 people may work on the site for up to three-day periods. Forest Service personnel would approve an area on a valid mining claim for residential occupancy within the Wilderness. Residential occupancy would be restricted to tents and associated nonpermanent structures similar to outfitter and guide camps within the Wilderness. A pit toilet would be located on the claims and used for daily human waste. Non-burnable waste would be disposed in approved facilities off Forest. Bear proof containers would be required for storage of all organic material. No use of generators or other motorized or mechanized equipment would be approved in the camp. Additional requirements for the camp are described in Appendix C.

Work on the mining claims would begin no earlier than one half hour before sunrise and end no later than one-half hour after sunset. No artificial lighting would be allowed on the claims with the exception of headlamps/flashlights, etc. The Forest Service would determine the number of packstock allowed to remain on-site.

Timing and Duration

The Responsible Official determined a reasonable operating period based on AIMM's proposed work was three years. Under emergency situations, the Responsible Official could extend the operating plan up to two additional seasons. The operating season would extend from mid-June until mid-October with most work occurring between early July and the middle of September.

Forest Service personnel would review the operations and bond annually to confirm that bonds are adequate and that continued operation is logical and sequential, and that planned activities are reasonably incident to mineral development. This review would not require a new federal decision unless new information about the mineral resource or environmental effects of the operation was obtained. In addition to the above described review, at the end of each operating season the Forest Service would arrange for a certified mineral examiner to inspect sampling activities onsite, independently sample and test mineral exposures, and review the year's sample test results.

Water

AIMM must apply for a water right from the State of Idaho for the use of water associated with the proposed plan of operations. Water use would be for mining purposes only. The amount of water for all uses must be limited to 2,500 gallons per day and 0.04 cubic feet per second (CFS) or less than ten percent of the stream flow, whichever is less.

Any water diversions must occur from an unnamed perennial stream (a tributary to Coin Creek) on claim No. 4, because the Central Idaho Wilderness Act stated that new diversions (defined as off claim diversions) would require presidential approval, which is not accounted for in this analysis. The Forest Service would approve the use of a waterline to be placed in the unnamed stream on claim No. 4. The stream flow would be measured at a point about 375 feet downstream of the confluence of Coin Creek and the unnamed stream that flows through claim No. 4. Monitoring would occur throughout the months of operation. The water diversion rate would be reduced if the flow at the point of measurement dropped below 0.4 CFS in order to maintain a removal of less than 10 percent of the flow. A new sized intake pipe limited to the withdrawal of 10 percent or less of the stream flow would be required to replace the old intake pipe.

Noxious Weed Management

All equipment (compressor, drills, saws, etc.) must be washed immediately before entering National Forest System lands to remove seeds and other vegetative material that could lead to noxious weeds infestations. Certified weed-free materials (i.e., seed, mulch) would be used for packstock feed and all revegetation work. Where possible, seed would be collected on site. Forest Service personnel would conduct monitoring before and after reclamation work to identify any noxious weed infestations. The operator would remove or pay for the removal of any noxious weed infestations.

Fire Prevention

The FC-RONR Wilderness Management Plan requires operating plans to include the following direction for fire protection: All internal combustion engines must have fire extinguishers and spark arrestors; caches of hand-tools are required; slash and other flammable debris must be disposed of by burning or removal; use of motorized equipment for fire suppression is restricted (USDA 1985, as amended, p. 45).

Monitoring

Monitoring activities are essential to the ensure protection of the environment. Monitoring activities are outlined in Table 2-5 and described in detail in Appendix F.

Reclamation and Bonding

Under Forest Service Mining Regulations at 36 CFR 228 Subpart A, reclamation bonds that are required must be posted with the Forest Service prior to approval of the plan of operation. The bond amount would include the full cost of reclamation, including administrative costs. The entire bond must be received before operations could begin. Any required bond adjustment would need to be completed prior to the beginning of each operating season.

Seasonal reclamation would include removal of all equipment and seeding of all disturbed sites with a certified weed free native seed mix to be specified by the Forest Service. Drill holes constructed during the operating season must be closed and reclaimed at the end of the season.

Close out would be conducted prior to the completion of operations. All remaining drill holes would be closed. Mine portals would be closed and revegetated. The Forest Service would gate one adit to allow for use by bats. All disturbed areas would be seeded with a certified weed-free native seed mix and mulch to be specified by the Forest Service. Equipment, tools, and supplies brought in for the approved mining operations would be removed from the Wilderness area and National Forest System lands by AIMM. The existing buildings whether on or off claim would be documented by a Forest Service cultural resources specialist and left standing. The gravel site at the Werdenhoff Mine would be reclaimed.

Forest Plan Amendment

Alternative D would require an amendment to the Forest Plan. It is a one time, site specific, non-significant amendment that would not change overall Forest Plan goals, objectives, Desired Future Conditions, or associated outputs. Alternative D would:

- Amend Management Area 26 (FC–RONR Wilderness) standards and guidelines (p. IV-351), Visual Resource Inventory and Planning, as follows: "For the Golden Hand Plan Of Operations Project, allow activities within the project area of approximately 20 acres that would not meet the Visual Quality Objective of Preservation."

Alternatives Eliminated from Detailed Consideration

Alternative E – Access by Helicopter

To avoid road construction in the Wilderness, reduce effects to soil and water and fisheries, and maintain wilderness character and experience, the ID Team considered an alternative that accessed the claims via helicopter. Although AIMM's proposed equipment could be brought in and moved around the claims by helicopter, it was determined that method would be disruptive to Wilderness users, and possibly to wildlife, create undue noise and safety issues, and be inordinately costly. Based on the results of the Surface Use Analysis (SUA) (Abbay 2003, Appendix B), the ID Team decided a non-motorized access scenario (by foot and packstock) coupled with the reasonable development scenario outlined in the SUA (Alternative D) provided a better alternative to the issues listed than did helicopter access. The non-motorized access and reasonable development scenarios form Alternative D, which was analyzed in detail in this DEIS.

Alternative F – Widening of FR 371 and 373 and FS Trail #013 to Accommodate AIMM's Vehicles and Equipment

An engineering review and survey were conducted to determine the amount of roadwork needed to accommodate AIMM's larger sized vehicles. For safety and resource protection, the ID Team determined that FR 371 and 373 and Forest Service Trail #013 would need to be widened two feet or more (from 8 to 10 foot widths to a 12 foot width) to accommodate AIMM's proposed vehicles and equipment (see discussion in the Roads and Access Management section). The ID Team considered two options: 1) widening of the road to accommodate the large vehicles or 2) use of smaller equipment.

A review determined the potential road widening to Forest Service standards would be very costly. These costs included equipment, blasting, end hauling of material (since side casting is generally not allowed), and seeding and mulching of cut and fill slopes. Widening the road could also lead to additional resource concerns such as increased traffic on the road and increased sedimentation from exposed cut and fill slopes.

Conversely, use of vehicles with smaller tread widths and equipment with narrower tracks would have costs similar to the use of larger vehicles and equipment. AIMM has not disclosed what equipment the company has available and what needs to be rented, but rental costs for a smaller articulated dump truck (with a tire tread width of less than seven feet) are approximately $9,000 per month. Compared to the cost of widening the road to Forest Service standards, the use of smaller equipment appeared to be more cost effective with fewer resource impacts. This alternative was analyzed in detail as Alternative C.

Based on a review of AIMM's proposed plan of operations, the Responsible Official directed the ID Team to assume that roads would be widened under AIMM's proposal, but without Forest Service management requirements and mitigation measures (such as identified in the Roads and Access Management section for Alternative C and in Appendix D).

Alternative G – Minimum Tools with Access by Foot and Pack Animal and Mining with Non-Mechanized Tools

Based on the reasonable development scenario outlined in the SUA (Alternative D), the ID Team was able to analyze a non-motorized access alternative. A reasonable development scenario still included the use of drilling equipment. Non-mechanized tools would not allow any of the proposed pre-development activities and was not considered reasonable by the Forest Service.

Table 2.5. Monitoring Plan Summary

Resource	Item	Frequency/Duration	Personnel
Minerals and Geology	Compliance with approved plan of operations	Daily over the life of the project	Forest Minerals Specialists and Wilderness Specialists
Roads and Access Management	Monitor barriers around the entry gate to the Wilderness to ensure compliance	Frequently each season	Forest Minerals Specialists and Wilderness Specialists
	Compliance with vehicle permit requirements (Alt. B and C only)	Frequently each season	Forest Minerals Specialists and Wilderness Specialists
Wilderness	Compliance with approved motorized and mechanized uses-including no. of vehicles accessing the Wilderness	Each season over the life of the project	Wilderness Specialist
	Visitor road use monitoring on Smith Creek Road	Each season over the life of the project	Wilderness Specialists
	Compliance with approved plan of operations-inspect camping area for compliance with Leave No Trace techniques (Alt. B and D only)	At least three times per season over the life of the project	Wilderness Specialists
	Monitor visual and audio impacts on wilderness experience	Each season over the life of the project	Wilderness Specialists
Soil and Water	Compliance with the Clean Water Act	Beginning and end of each operating season over the life of the project	American Independence Mine and Minerals, Inc.
Fisheries	Compliance with PACFISH standards and guidelines and RHCA widths	Once during spawning season for listed species, and at the end of each operating season, over the life of the project. For bull trout, monitoring begins August 15th and continues every two weeks over the work season	Fisheries Biologist and Minerals Specialists
Noxious Weeds	Noxious weed eradication and control	Annually and for five years after end of operations	Forest Service Specialists
Cultural Resources	Compliance with the MOA and Sec. 106 of the NHPA	Two times over the life of the project	Heritage Program Manager

Table 2-6. Comparison of Project Features for each Action Alternative Considered for the Golden Hand Mine Project

Component	Alternative B Proposed Plan	Alternative C Modified for Resource Protection	Alternative D Non-Motorized Access
Scope of Operations	New road construction, drilling, trenching, extraction of bulk samples	New road construction, drilling, excavation of bulk samples from underground, motorized access	Drilling and extraction of bulk samples by foot and pack stock
Access & Road Maintenance	Maintain minimum 10 feet road widths, limited dips (cross drains), armoring	FR 371 & 373 maintain current road widths; install culverts, dips, gravel, bridge	FR 371 & 373 maintain as in C; Wilderness access foot, pack stock
Road Construction	4 miles	3.4 miles w/BMPs, no roads off old roadbeds in RHCAs or steeper soil saturation zones	None
Development Work	31 drill & 5 trench sites (total 750 ft at 5'x5'); clean adits w/limited extraction; haul maximum 10 dump truck loads ore to Walker Millsite for bulk testing	Sequence up to 31drill sites on roadbeds or off with mitigation to within 50' of stream; no trenches; haul max. 10 dump truck loads ore to Walker Millsite for testing	Sequence up to 14 drill sites in vicinity of inferred ore deposit; drill with mitigation to within 50' of stream; no trenches; haul samples to Walker Millsite for testing
Vehicles and Equipment	14 yd^3 tandem axle dump truck, pickup truck (2), haul truck One round trip per operating season for equipment	All vehicles <7' tread width. CAT D250D articulated dump truck (or equivalent) with 7' tread width, pickup truck (2); 8' track width for equipment One round trip per operating season for authorized equipment	All vehicles <7' tread width and equipment 8' track width to Pueblo Summit. As in Alt. C to Pueblo Summit. Foot travel or pack stock to mine site One round trip per operating season for authorized equipment to Pueblo Summit
	Bulldozer in size range of a Cat D7 or smaller	Bulldozer	Not needed or out of Wilderness only
	Austin Western 99h road grader.	Road grader	Road grader - outside of Wilderness only.
	Air compressor (≤600 cfm)	Air compressor (≤600 cfm)	Air compressor (≤600 cfm) (pack/skid)
	Light plant	Light plant	No
	John Deere 450 backhoe/loader	Rubber tired backhoe/loader	Not needed – no trenching
	Smaller truck or track-mounted core or reverse circulation type drill rigs	Drill rig (portable and/or truck mounted)	Drill – backpack or stock portable
	Underground mining machinery	Underground mining machinery	Portable
	Saws	Saws	Saws
	Generator	Generator for mining purposes only	Generator for mining purposes only

Component	Alternative B Proposed Plan	Alternative C Modified for Resource Protection	Alternative D Non-Motorized Access
Hazardous Materials	Fuel quantities < 250 gallons in sealed tank or barrel containers on in going trucks	Fuel quantities < 250 gal. in sealed tank or barrel containers. Fuel storage on claim, outside RHCAs. Carry spill prevention kits and fire extinguishers. Explosives per approval	As in Alt. C to summit, but in portable containers in the Wilderness. Use of explosives per approval
Timbers	Timbers cut out of sight of trails except hazard trees along trail or road. Used as firewood or mine timbers	Cut timber outside of Wilderness in designated area and haul to site (Figure 1-2). Forest Service would identify and mark trees to be cut	For drill platforms – Forest Service would identify and mark trees to be cut on claims
Work Crew and Housing	House 6 people in bunkhouse (need to restore for safety, occupancy in Wilderness not compliant w/FS direction). Existing outhouse for human waste. Domestic water hauled to dump or pickup station. Burn garbage, unburnable material haul to landfill	Outside of Wilderness. Vehicle access to the mining claims would eliminate the need for residential occupancy onsite	Approx. 6 individuals inhabit wall tents on claims use pit toilet, bear proof containers, gray water containment
Timing and Duration	120 days or less each operating season for a period of up to 10 years	120 days or less each operating season for up to 3 years. Most operations between 7/1 and 9/15	120 days or less each operating season for up to 3 years. Limited operation after 8/15
Water	Believe exempt from permitting and filing requirements. Divert water from creek with pipe. "Right" limited to 13,000 GPD for domestic purposes & 2,500 GPD w/rate of .04 CFS for mining purposes	A water rights filing, including the amount and period of use, is required. Divert w/pipe from creek on claims, limited to 10% of streamflow at confluence w/Coin Creek. No ditches or dams	Same as in Alt. C
Noxious Weed Management	Not specified	Wash all equipment before entering the NFS lands, revegetation work with certified weed-free materials, monitoring to identify & treat noxious weed infestations	Same as Alternative C, livestock feed certified weed-free
Reclamation - interim or seasonal	Waterbar on-claim roads. Seed cut and fill slopes if natural revegetation not progressing satisfactorily	Remove all equipment & seed all disturbed sites with a certified weed free native seed mix Fill & reclaim trenches and drill holes	
- final	Only at end of mining. Waterbar roads and trails not used by foot or horse traffic. Seed with grass	Backfill drill holes. Fully recontour most roads used with equipment approved in plan. Partially recontour roads used as trails. Reseed disturbed areas certified weed-free native seed mix and mulch. Haul out vehicles, tools, equipment, and supplies.	Backfill remaining drill holes. Reseed all disturbed areas with a certified weed-free native seed mix and mulch. Remove tools, and supplies.

Table 2-7. Comparison of Alternatives by Effects to Significant Issues for the Golden Hand Mine Project

INDICATORS	ALT A	ALT B	ALT C	ALT D
Issue #1- Mineral development				
Geologic info. obtained	Mapping -Sampling -Geophysical surveys	As in plan: -Mapping -Sampling -Geophysical surveys -Drill data -Underground mapping, sampling	Similar to plan, no trenching	Similar to plan, drilling around ore reserve, no trenching
Reasonably incident activities (per Surface Use Analysis)	Yes	No	Yes	Yes
Comply w/ PACFISH mineral direction items	5 out of 5 comply	1 out of 5 complies	4 out of 5 comply	5 out of 5 comply
Issue #2- Roads and access management				
Changes in miles of roads	No change	+4 miles temporary	+3.4 miles temporary	No change
Condition of roads outside Wilderness	No change	No improvement	Major improvement	Major improvement
Condition of roads and trails in Wilderness	No change	Non-compliant	Non-compliant	Compliant
Issue #3- Wilderness character				
Effects on natural integrity	Maintained	Highest	High	Moderate
Effects on untrammeled condition	Maintained	Highest	High	Moderate
Issue #4- Wilderness experience				
Effects to solitude and sense of remoteness	Maintained	Highest	High	Moderate
Effects to primitive recreation	Maintained	Highest	High	Moderate
Issue #5- Water quality				
Est. sediment delivery on FR 371 and 373 (tons/yr)	18.4	19.6	1.5	1.5
Est. sediment delivery in Wilderness (tons/yr)	0.0075	5.1	1.0	0.0075
Risk of metal contamination	No change	Low risk, no monitoring	Lower risk, with monitoring	Lower risk, with monitoring
Issue #6- Riparian areas and wetlands				
Riparian areas and wetlands affected	None	0.11 acres in & out of Wilderness	0.06 acres	None
Issue #7- Fish populations and habitat of concern				
Large Woody Debris (LWD)	No change	Potential to degrade	Maintain	Maintain
Sediment	No change	Degrade	Degrade in Wilderness, improve outside of Wilderness	No change in Wilderness, improve outside of Wilderness

INDICATORS	ALT A	ALT B	ALT C	ALT D
Flow	No change	Degrade	Maintain	Maintain
Risk of chemical contamination	No change	Moderate risk	Low risk	Very low risk
Road density and location	No change	Increase	Increase	Maintain
Issue #8- Wildlife populations and habitat				
Amount of habitat modified for species of concern	None	Minimal	Minimal	Minimal
Effects of human activity on wildlife populations	No change	Displacement for up to 10 years	Displacement for up to 5 years	Displacement for up to 5 years
Issue #9- Noxious weed establishment and spread				
Establishment and spread of noxious weeds	No change	No specified mitigation	mitigation	mitigation
Issue #10- Cultural resources and tribal trust responsibilities.				
Compliance with: National Historic Preservation Act (NHPA) & Archaeological Resources Protection Act (ARPA)	Compliant, but still adverse effects	Compliant, but still adverse effects	Compliant, but still adverse effects	Compliant, but still adverse effects
Tribal trust responsibilities	No effect	Possible effects	Possible effects	Effects unlikely

Preferred Alternative

Alternative C is the Forest Service preferred alternative.

CHAPTER 3. AFFECTED ENVIRONMENT AND ENVIRONMENTAL EFFECTS

Contents

CHAPTER 3
AFFECTED ENVIRONMENT AND ENVIRONMENTAL EFFECTS

Introduction

This chapter describes the physical, biological, and human resources that may be affected by the alternatives presented in Chapter 2, and the environmental effects that the alternatives may have on those resources. The Affected Environment and Environmental Effects have been combined into one chapter to provide continuity of the resource discussions. The environmental effects analysis forms the scientific and analytical basis for the comparison of alternatives provided at the end of Chapter 2. Appendix A contains a table that lists the activities used in the cumulative effects analysis.

Chapter 3 is organized into eight resource sections listed below with the following issues:

Minerals and Geology

Issue #1: The effects of the proposed activities on mineral development.

Roads and Access Management

Issue #2: The effects of the proposed activities on roads and access management in the analysis area.

Wilderness Resource

Issue #3: The effects of the proposed activities within the FC-RONR Wilderness on the wilderness character.

Issue #4: The effects of the proposed activities within the FC-RONR Wilderness on the visitors' wilderness experience.

Soil and Water Resources

Issue #5: The effects of the proposed activities on water quality.

Issue #6: The effects of the proposed activities on riparian areas and wetlands.

Fisheries Resource

Issue #7: The effects of the proposed activities on fish populations and habitat of concern (federally listed species, sensitive species, and Management Indicator Species).

Wildlife Resource

Issue #8: The effects of the proposed activities on wildlife populations and habitat of concern (threatened and endangered wildlife species; Region 4 sensitive species; Management Indicator Species; and Idaho Species of Concern).

Noxious Weeds

Issue #9: The effects of the proposed activities on noxious weed establishment and spread in and adjacent to the project area.

Cultural Resources

Issue #10: The effects of the proposed activities on cultural resources and Tribal trust responsibilities.

Minerals and Geology

Scope of the Analysis

Issue #1: The effects of the proposed activities on mineral development.

Indicators

- **Geologic Information to be Obtained.** Does the quality and quantity of information to be obtained from the implementation of each alternative meet the proponent's stated objectives?
- **Activities Reasonably Incident to Mining.** Are the activities in the alternatives reasonably incident to mining?
- **Compliance with Forest Plan Direction for Mineral Development, specifically PACFISH Standards and Guidelines for Minerals.**

Background

The 1872 Mining Law, as amended (30 USC 22, *et seq*.), allows U.S. citizens the right to locate, explore, and develop mining claims on federal lands that are open to mineral entry. Mining claims on lands closed to mineral entry may be developed subject to "valid existing rights". The Interior Board of Land Appeals (IBLA) has found the Golden Hand No's. 3 and 4 lode mining claims within the FC-RONR Wilderness to be valid.

Section 4 of the Multiple Use Mining Act of 1955 (69 Stat. 367) states that, prior to patent, mining claims may be used only for "...prospecting, mining or processing, and uses reasonably incident thereto." Additionally, the Wilderness Act of 1964 provides and allows for surface disturbing activities that are reasonably incident to mining or processing operations when valid rights have been found to exist (Wilderness Act 1964, Central Idaho Wilderness Act 1980).

Major Comments: Public, agency, organization, and Tribal Government comments regarding mineral development focused on whether further development was supported based on past geologic information, stated that development work should be limited to where deposits have been documented and the value determined, requested the Forest Service to conduct independent analyses of mineral samples, and emphasized the need for adequate reclamation and bonding of the operation. Other comments stated the plan of operations is both reasonable and incident to mining. Some comments stated that mineral extraction and removal should be conducted using technology available when the 1872 mining law was enacted.

History of the Golden Hand Mine Site

J.M. Hand discovered the Golden Hand deposit in 1889. It is located in the Edwardsburg Mining District. The first development occurred on small veins on the north side of Coin Creek. Two short adits produced $1,200 in gold (Shenon and Ross 1936). Sometime after 1896 the property was acquired by the Penn-Idaho Company, which developed two adits (total length of 1150 feet) on the Neversweat No.1 claim (presently Golden Hand claim No. 8) on the south side of Coin (Cache) Creek. No production figures are available for this period. By 1933, ownership had passed to Golden Hand, Inc. with the property consisting of 26 unpatented lode claims. Development at this time was focused on the Neversweat No.2 claim located approximately where the present Golden Hand No's. 3 and 4 claims lie. Two short adits and two open cuts were mined; with most of the recorded production coming from high-grade oxidized ore in these near-surface workings. Production from 1932-34 totaled 1,368 ounces of gold and 301 ounces of silver. Production decreased until 1941, after which no production or development was reported (Cater et al. 1973). The total recorded gold and silver production value is $44,212 (ibid). Later exploration work was apparently unsuccessful, although some exploratory drifting in 1938 reportedly cut a vein having extremely high assay values (Lorain 1938). Claude Elliott relocated the claims in 1963. Golden Hand No's. 1-5 lode mining claims were located by Jim Collord and American Independence Mines and Minerals, Inc. (AIMM) in 1979. In 1983, AIMM located Golden Hand No's. 6-8. Jim Collord subsequently deeded his interest in claims No. 1-5 to AIMM.

Since 1941, exploration and development has been limited to geologic mapping, surface and underground sampling, and construction of dozer trench on several of the Golden Hand claims (McRae 1956). Most of this activity occurred before 1979. After the Idaho Primitive Area was established in 1931, preexisting travel routes were all considered trails. Motorized access was authorized through the issuance of Class D Road Use Permits. The Forest Service issued these permits to claimants at the Golden Hand for the purpose of conducting assessment and exploration/development work until January 1, 1984, when the FC-RONR Wilderness was withdrawn from mineral entry under provisions of the Wilderness Act, subject to valid existing rights. In the past, AIMM was authorized by the Forest Service to access the Golden Hand claims using motorized equipment, and conduct assessment, exploration, and development work. The approved activities included:

- **1980** - Clearing roads to allow vehicle access, and "recovery of gold bearing material...by means of pick and shovel and a hand operated rocker box" (Collord 1980).
- **1981** – "Clean out caved tunnel portals & sample...drilling" (Walker 1981). Equipment included backhoe-loader, compressor, and tractor.
- **1982** – "...similar to 1981" (Walker 1982).
- **1983** – The "work plan for this property is identical as that filed for 1982 with no change" (Walker 1983).
- **1984**- "...drilling and soil sampling...ore extracted will be hauled out of the wilderness area for mill testing and processing" (Walker 1984). *This activity was inadvertently approved after the withdrawal date in the Central Idaho Wilderness Act.*

According to Forest Service records, most of the actions listed above, including the drilling and opening closed adits, were never implemented.

Administrative Record

The administrative record on the Golden Hand claim group is lengthy. The recent events leading to the preparation of this Environmental Impact Statement on AIMM's proposed plan of operations are briefly summarized as follows:

- In March 1985, AIMM submitted a plan of operations that the Forest Service determined would result in significant disturbance to surface resources on the Golden Hand No's. 1-8 lode mining claims in the FC-RONR Wilderness.
- The Forest Service conducted a mineral examination in July 1985 to determine if any of the Golden Hand claims were valid prior to processing the plan of operations.
- The mineral report was completed in November 1986. It concluded that none of the eight claims were valid and recommended to the Department of Interior that contest be initiated against all of the claims.
- AIMM timely appealed the BLM's contest notice. A hearing was held before Administrative Law Judge Ramon M. Child who ruled on January 19, 1989, that Golden Hand claim No.'s 1, 5, 6, and 7 were invalid and dismissed the contest on claim No's. 2, 3, 4, and 8.
- Both parties appealed to the IBLA. On February 10, 1992, the Board affirmed Judge Child's decision that claim No.'s 1, 5, 6, and 7 were invalid and that claim No.'s 3 and 4 were valid. It reversed his decision that claim No. 2 was valid and remanded claim No. 8 back to the Hearings Division for review of the historic value of silver as it bore on the validity of claim No. 8. The Forest Service later dismissed its contest against claim No. 8.
- AIMM submitted a proposed plan of operations for work on claims No. 3 and No. 4 on April 16, 1996.
- AIMM filed suit in 1999 in Idaho Federal District Court seeking an order requiring the Forest Service to allow access to the claim group for work under the 1996 plan and for other purposes.
- On August 9, 2002, Judge B. Lynn Winmill entered orders on three points raised by AIMM. One of those ordered the Forest Service to complete the EIS and its review of the 1996 plan by May 1, 2003.

Management Direction

The Forest Plan (USDA 1988, as amended) and federal and state laws and regulations guide management of mineral resources on the Payette National Forest. Mineral development in Wilderness is also guided by the Wilderness Act of 1964, the Central Idaho Wilderness Act (1980) and the FC-RONR Wilderness Management Plan (USDA 1985, as amended).

Regulations defining Forest Service authority to manage locatable mineral activities were adopted in 1974 and are codified in 36 CFR 228A. In accordance with these regulations, an approved plan of operations is required for any locatable mineral activity on National Forest System land that would cause a significant disturbance of surface resources. The Forest Service responses to a

proposed plan of operations are defined by regulation at 36 CFR 228.5. The overall purpose of these regulations as stated in 36 CFR 228.1, is to manage operations so as to minimize adverse environmental impacts on National Forest System surface resources.

Mining in Wilderness

The Wilderness Act allows mining development in designated Wilderness subject to "valid existing rights". Direction for managing mining activities in wilderness under Forest Service mining regulations is found at 36 CFR Section 228.15 that states, in part, at section 228.15 ©:

> Persons with valid mining claims wholly within National Forest Wilderness shall be permitted access to such surrounded claims by means consistent with the preservation of National Forest Wilderness which have been or are being customarily used with respect to other such claims surrounded by National Forest Wilderness.

Activities Reasonably Incident to Mining

The Forest Service minimizes, where feasible, adverse impacts to National Forest surface resources by ensuring that use of the surface for mining activity is reasonably incident to mining. Adverse impacts that are not acceptable are those uses of the surface that cause significant disturbance that is not reasonably incident to mining.

The authority for the Forest Service to ensure that National Forest lands, including those under mining claim locations, are used only for purposes required for and reasonably incident to mining and in a manner that minimizes adverse environmental impacts, falls under the agency's broad authorities primarily, but not limited to, the following statutes and case law:

1. The Organic Act of 1897 (16 USC 478, 551)
2. Multiple Use Mining Act of July 23, 1955 (30 USC 612).
3. Title 36 Code of Federal Regulations, Part 228, Subpart A - Locatable Minerals
4. U.S. v. Richardson, 599 F. 2d 290 (1979); Cert. denied, 444 U.S. 1014 (1980)

Additional discussion appears under the Affected Environment section.

Access

Access to unpatented mining claims is a statutory right granted to claimants under the 1872 Mining Law, as amended. Access, however, is not uncontrolled or unconditioned even on claims having "valid existing rights". Where access may cause significant impacts to surface resources, Forest Service mining regulations at 36 CFR 228 Part A require that a plan of operations be submitted and evaluated and that the Forest Service minimize, where feasible, adverse impacts.

Reclamation and Bonding

Forest Service mining regulations at Title 36 CFR 228.8 and 228.13 provide direction for reclamation and bonding. On all mining claims validly established on lands within the National Wilderness Preservation System, the operator shall take all reasonable measures to remove any structures, equipment and other facilities no longer needed for mining purposes in accordance with the provisions in Sec. 228.10 and restore the surface in accordance with the requirements in Sec. 228.8(g) (36 CFR 228.15(b)).

Forest Plan Direction

Forest Plan (USDA 1988, as amended) standards and guidelines for minerals management include (but are not limited to) the following:

- Access shall be authorized where necessary for mineral development. Road construction, reconstruction, and commercial road use outside the claims being developed shall be authorized through a ...Plan of Operations (p. IV-99).
- When mine development proposals include roads, the NEPA process and documentation will be used to analyze and evaluate proposed routes (p. IV-99).
- Unnecessary impacts to surface resources will be minimized through inclusion of reasonable environmental prosecute measures in the operating plan. Forest Service mining regulations at section 228.8 specify measures applicable to surface resources, particularly air quality, water quality, solid wastes, scenic values, fisheries and wildlife habitat...(p. IV-99).
- All practicable measures shall be employed to maintain and protect fisheries and wildlife habitat which may be affected by the operations...(p. IV-100).
- Mining development roads shall be constructed and maintained to assure adequate drainage and to minimize or, where practicable, eliminate damage to soil, water, and other resource values. Mitigation measures and seasonal maintenance practices for mining access roads should be part of the operating plan...Roads no longer needed should be closed to vehicular traffic;...cross-drains, dips, or water bars constructed; and the road surface shaped to as near natural contour as practicable and stabilized (p. IV-101).
- A permanent acceptable ground cover....must be provided...acceptable species must contribute to species diversity, be non-noxious, and be approved by the Forest Service (p. IV-101).
- Bonding for reclamation shall be adequate for the Forest Service to accomplish agreed upon reclamation standards in the event of default by the operator (p. IV-102).

The overall objective under Minerals and Energy in the FC-RONR Wilderness Management Plan (USDA 1985, as amended) is to: "Administer mining activities to assure the least possible impact on the wilderness resource without unreasonable impairment on property rights, and provide for the orderly development of mineral resources" (USDA 1985, as amended, p. III-41). Additional direction in the minerals section includes: "Reasonable access cannot be denied, but should be located to have the least long lasting impact on Wilderness values..." and:

- Harmonize operations with scenic values to the extent possible.
- Utilize design, location, and screening to blend structure and improvements (including roads) with the landscape.
- Minimize lasting evidence of timber removal; avoid making obviously artificial openings, and cut stumps as close to the ground as practicable (p. III-44).

The Forest Plan has been amended to include goals, objectives, standards, and guidelines for protection of anadromous and inland fisheries as defined in the *Interim Strategies for Managing Anadromous Fish-producing Watersheds in Eastern Oregon and Washington, Idaho, and Portions of California* (known as "PACFISH") (USDA and USDI 1995) and the *Inland Native Fish Strategy* (known as "INFISH") (USDA 1995). Both are interim habitat protection and restoration strategies designed to protect and improve aquatic health using Riparian Habitat Conservation Areas (RHCA) and Riparian Management Objectives (RMO). PACFISH direction applies to the project area. PACFISH direction for Minerals includes:

MM 1 - Avoid adverse effects to listed species and designated critical habitat from mineral operations. If the Notice of Intent indicates a mineral operation would be located in a Riparian Habitat Conservation Area (RHCA), or could affect attainment of Riparian Management Objectives (RMOs), or adversely affect listed anadromous/inland native fish, require a reclamation plan, approved Plan of Operations (or other such governing document), and reclamation bond. For effects that cannot be avoided, such plans and bonds must address the costs of removing facilities, equipment, and minerals; recontouring disturbed areas to near pre-mining topography; isolating and neutralizing or removing toxic materials; salvage and replacement of topsoil; and seedbed preparation and revegetation to attain RMOs and avoid adverse effects on listed anadromous and inland native species. Ensure Reclamation Plans contain measurable attainment and bond release criteria for each reclamation activity.

MM 2 - Locate structures, support facilities, and roads outside RHCAs. Where no alternative to sitting facilities in RHCAs exists, locate and construct the facilities in ways that avoid impacts to RHCAs and streams and adverse effects on listed anadromous/ inland native fish. Where no alternative to road construction exists, keep roads to minimum necessary for the approved mineral activity. Close, obliterate, and revegetate roads no longer required for mineral or land management activities.

MM 3 - Prohibit solid and sanitary waste facilities in RHCAs.

MM-5 - Permit sand and gravel mining and extraction within Riparian Habitat Conservation Areas only if no alternatives exist

MM 6 - Develop inspection, monitoring, and reporting requirements for mineral activities. Evaluate and apply the results of inspection and monitoring to modify mineral plans, leases, or permits as needed to eliminate impacts that prevent attainment of RMOs and avoid adverse effects on listed fish.

Compliance with this direction will be tracked for all Alternatives.

Analysis Area

The analysis area for direct and indirect effects to the mineral resource is the project area described in Chapter 1 (Figure 1-2). Cumulative effects to the mineral resource are evaluated for the Edwardsburg Mining District - bounded by Big Creek on the south, Beaver Creek on the east and north, and Mosquito Ridge on the west (Cater et al. 1973).

The Forest Service has received a number of maps depicting the location and orientation of the present Golden Hand lode mining claims No's. 3 and 4. Recent field reviews have indicated that perhaps none of these maps show the true position of the claims. It is important that the Forest Service verify that any authorized surface disturbance beyond the principal property access route is actually on claims No. 3 and No. 4. Prior to approval of the plan of operations by the Forest Service, AIMM must identify in the field the claim corner monuments, complete their base map, and participate in their proposed joint field orientation.

Affected Environment

Existing Condition

Physiography

The Golden Hand Mine site is situated in the northern Rocky Mountain Physiographic Province, in the Salmon River Mountains of Central Idaho. Elevations on Golden Hand lode mining claims No.3 and No.4 are between 6,800 feet and 7,600 feet. The claims lie within the Coin Creek drainage. Coin Creek occupies a steep northeast-trending glacial valley with elevations ranging from 8,682 feet at the north end of the Pueblo Ridge to 5,800 feet at the confluence of Coin Creek and Beaver Creek. The Golden Hand Mine site lies in a transition zone where the broad upper valley narrows down to a glacial trough. Slopes are generally steep and often rocky.

Regional Geology

The oldest rocks in the area belong to the North American Continental Province and are metamorphic and igneous rocks of Mesoproterozoic age (approximately 1,500 million years ago) to Neoproterozoic age, approximately 700 million years ago (Lund, unpublished) (see Figure 3-1). During the Late Cretaceous period (95-70 million years ago) two distinct series of plutons (a body of igneous rock that has formed beneath the surface of the earth by consolidation from magma (AGI 1976) intruded the North American Continental rocks to form the Idaho Batholith. Post-Cretaceous crustal extension resulted in the eruption of the Eocene (51-39 million years ago) Challis volcanics and emplacement of associated intrusive rocks. Most of the Quaternary deposits in the area are a result of Pleistocene glaciation (15-10 thousand years ago).

Geology of Project Area

The Golden Hand Mine site is located along the northwestern boundary of a large area of North American Continental rocks known as the Big Creek roof pendant. Mesoproterozoic biotite phyllite forms the Pueblo Ridge above the mine site. Using the revised stratigraphic nomenclature of Tysdal (2000), Lund (unpublished) correlates this unit with the Apple Creek Formation from the upper Lemhi Group. Below Pueblo Ridge, quartzite and argillite outcrop immediately above the mine. These rocks (along with the biotite phyllite above) were thought to belong to the Yellowjacket Formation by early authors, but whether they strictly correlate with the Yellowjacket Formation as redefined by Tysdal (2000), is uncertain. This analysis will use the general term Yellowjacket Formation for the metamorphic rocks that outcrop in the immediate vicinity of the mine site. Cretaceous biotite-muscovite granite outcrops north of the mine. This granite is the roof of a late-series Idaho Batholith pluton that was the source of mineralization. Further to the northeast Eocene granite porphyry crops out. This belongs to the roof facies of the Chamberlain Basin pluton that intruded both the Proterozoic metasediments and Cretaceous granite. Tertiary dikes of variable composition cut both the Yellowjacket strata and the Idaho Batholith granite.

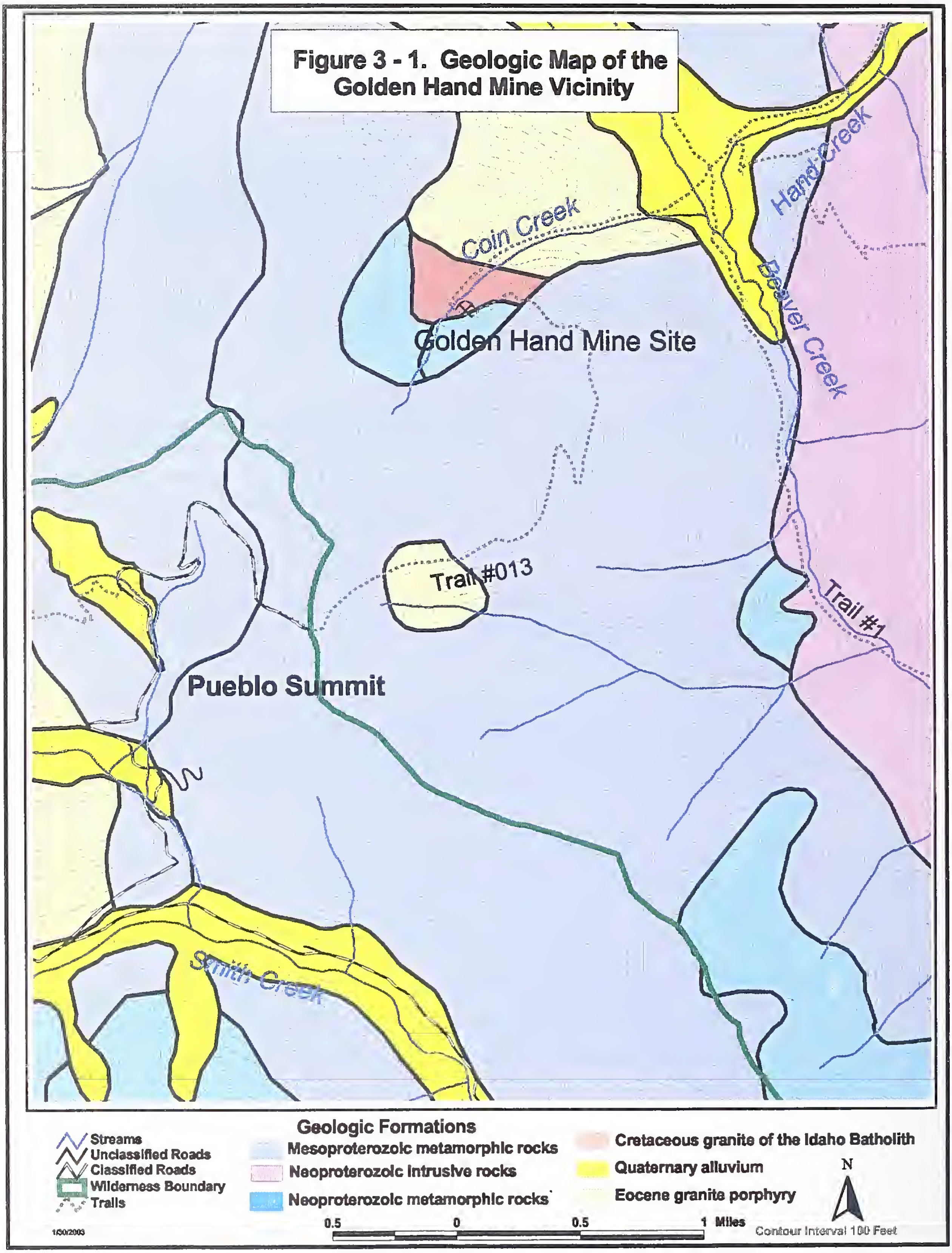


Figure 3 - 1. Geologic Map of the Golden Hand Mine Vicinity
Coin Creek
Hand Creek
Beaver Creek
Golden Hand Mine Site
Trail #013
Trail #1
Pueblo Summit
Smith Creek
Streams
Unclassified Roads
Classified Roads
Wilderness Boundary
Trails
1/30/2003
Geologic Formations
Mesoproterozoic metamorphic rocks
Neoproterozoic intrusive rocks
Neoproterozoic metamorphic rocks
Cretaceous granite of the Idaho Batholith
Quaternary alluvium
Eocene granite porphyry
N
0.5
0
0.5
1 Miles
Contour Interval 100 Feet

Structure

The oldest structure in the area is a northeast-trending fault that cuts the Yellowjacket Formation approximately along the course of Coin Creek (Kirkpatrick 1974). The Golden Hand site lies near the northern end of a zone of north-northeast trending dikes, shear zones, and quartz-filled fissures referred to by Bell (1934) as the Big Creek mineral belt. This zone lies within the larger zone of mineralization known as the Thunder Mountain – Dixie belt (Bookstrom et al. 1998) which runs along the eastern margin of the Idaho Batholith. Two parallel, north-striking shear zones run through the Golden Hand claims (O'Hara 1989). The age of these shear zones is uncertain, but they either pre-date or are contemporaneous with emplacement of the Idaho Batholith. Tertiary dikes in the immediate area strike northeast on the south side of Cache Creek and northwest on the north side of the creek. The dikes may be associated with emplacement of the Chamberlain Basin pluton, and/or outliers of the Profile Gap – Smith Creek dike swarm (a set of numerous, parallel dikes). This north-northeast trending dike swarm lies a couple miles west of the mine and extends as far north as the headwaters of the West Fork of Cache Creek (as mapped by Cater 1973).

Mineralization

Mineralization at the Golden Hand occurs primarily near the Yellowjacket Formation –Idaho Batholith contact and is interpreted as being the depositional product of dilute mesothermal fluids related to the granite (Bookstrom et al. 1998). The shear zones (mentioned above) provided conduits of increased permeability for the fluids. O'Hara (1989) determined that the trace element content of alteration minerals in the two shear zones is distinctly different, and suggested that either two separate hydrothermal systems were present, or that two mineralization events occurred at different times in the same system. Bookstrom and others (1998) note that up to six distinct episodes of mineralization have been identified in gold-silver mixed-metal veins of the Edwardsburg district. These mineralization events occurred 79-69 million years ago.

The minerals of interest at the Golden Hand are gold (Au) and silver (Ag). Primary ore minerals are pyrite, galena, sphalerite, tetrahedrite, chalcopyrite, and free gold. Gangue (nonvaluable metalliferous or nonmettalliferous minerals in the ore) minerals include quartz, calcite, sericite, and epidote (Shennon & Ross 1936). Ore was deposited in a variety of environments. Lorain (1938) reports that the ore on the north side of Coin Creek occurs in small quartz veins formed along bedding planes in the Yellowjacket Formation. The Penn-Ida adits on the Golden Hand No. 8 claim cut two different sets of quartz veins in the Idaho Batholith granite. In addition, disseminated pyrite and tetrahedrite occur in a quartz latite porphyry dike. Most of the ore at the "Glory Hole" (an open cut and adit system) on the Golden Hand No. 3 and No. 4 claims occurs as veinlets and discontinuous stringers in the highly fractured and silicified Yellowjacket-Batholith contact zone. Some ore is disseminated in argillite of the Yellowjacket Formation. The near-surface zone of the Glory Hole had the largest historic production.

Ore Values

Early reports document the decline in ore grade (expression of relative quality – usually Troy ounces per short ton (oz/T) or grams per metric ton (g/t)) at the Glory Hole as it was developed. Paddison (1932) gives a wide range of assay values (0.04 – 15.24 oz/T Au) during the early stages of mining. Shennon & Ross (1936) refer to an average gold recovery of 2.3 oz/T Au during the production peak in 1933. Bell (1934) calculates an average ore grade of 0.5 ox/T Au in 1934. Assay work done by McRae (1956) yielded values of 0.02 – 0.30 oz/T Au.

Several sampling programs have been implemented in more recent times in an effort to define the ore grade remaining in the area of the Glory Hole. Sampling has been done by AIMM consulting geologists (Morgan in 1984, Hubbard in 1985, and O'Hara in 1987), Forest Service personnel (Wallace in 1984, Thurmond in 1985), and Bureau of Mines personnel (Cater in 1973 and Thompson and Boleneus in 1990). The average assay values reported by the various sources range from 0.018 – 0.080 ounces of gold per ton.

Vanderwall (1985) used 62 samples acquired by Morgan, Hubbard, O'Hara, and Thurmond to calculate an average ore grade of 0.054 ounces of gold per ton. He used this figure along with projected ore body dimensions to calculate "indicated reserves" of 39,690 tons containing 2,143 ounces of gold. He also calculated "inferred reserves" of 241,080 tons for a total of combined 280,770 tons indicated and inferred reserves containing 15,162 ounces of gold. Thompson and Bolenus (1990) reviewed these reserve estimates and found the indicated reserve values to be reasonable, but questioned the assumptions used to derive the inferred reserves. They felt that the length dimension was reasonable on the basis of observed geology, but that the width and depth were not. In addition they state that there is little sampling or geological evidence to support continuing the 0.054 oz/T grade in the increased volume. Additional information on the Golden Hand ore reserves can be found in the *Surface Use Analysis of the Plan of Operations on the Golden Hand #3 and #4 Lode Claims* (SUA) located in Appendix B.,

Other Mining Activity

The Edwardsburg mining district is bounded by Big Creek on the south, Beaver Creek on the east and north, and Mosquito Ridge on the west (Cater et al. 1973). Active mining in this area is limited. Only the Fourth of July, Camp Bird, and Velvet Quartz Mine properties have seen exploratory or intermittent efforts at development in the last 15 years. Numerous lode and placer deposits in the district have been explored in the past, but only one lode deposit, the Golden Hand, is known to have been productive.

The Fourth of July and Camp Bird Mines are owned by Jack Walker (operating partner of AIMM) and located in Government Creek and Logan Creek, respectively. The Fourth of July is on NFS land and it's operation is authorized by a plan of operations approved by the Payette National Forest in 1989. The Camp Bird is on private land. The Fourth of July has operated sporadically over the last 10 years but, outside of maintenance, the Camp Bird has seen little activity for more than 30 years.

Jack Walker also owns a small, 50-ton per day, gravity mill on NFS land in Logan Creek. The Fourth of July has provided ore for milling but the mill has never operated on a continuing basis. The mill is covered by a plan of operations approved by the Forest Service in 1990.

The Velvet Quartz Mine and Mill (Jerry and Lettie Tucker) are in the N. Fork of Smith Creek, about two miles southwest of the Golden Hand. The mill and mine are on NFS land, operating under a plan approved by the Forest Service in 1984. This very small one or two person operation produces at most only a few tons of ore annually, and has been largely inactive since 1996.

Indicators

Geologic Information to be Obtained: Does the quality and quantity of information to be obtained from the implementation of each alternative meet the proponent's stated objectives?

The purpose of the plan of operations proposed by AIMM is to "further develop the Golden Hand ore body" (Ross 1996). Since the submittal of the plan of operations, AIMM has stated their "overall objective is to develop the most profitable mine possible on the claims. To accomplish this objective, we need to fully delineate the mineral deposits on the claims" (Ivy 2002c). AIMM states they need to complete the following work to fully delineate the mineral deposits:

1. Prepare more detailed geologic mapping
2. Conduct additional, non-surface disturbing soil and lithogeochemistry sampling
3. Conduct non-surface disturbing geophysical traverses
4. Drill boreholes to determine the spatial position of the deposit in three dimensions
5. Trench to obtain bulk samples for metallurgical testing

The two methods likely to have the most impact to surface resources are drilling and trenching and will be described below.

Drilling

Drilling is the method proposed to collect the subsurface information. The two methods of drilling proposed are diamond core and reverse-circulation rotary.

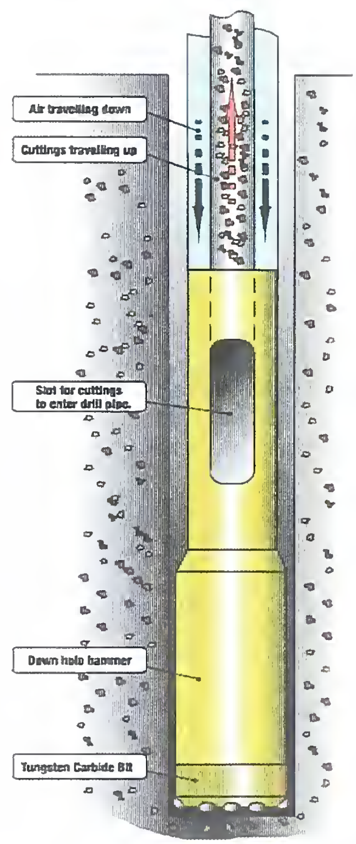


Photo 3-1. Reverse-circulation drill fluid path.

Diamond core drilling is the most versatile of all methods (Peters 1987). It is relatively expensive, but can be used at almost any location and holes can be directed at virtually any angle. Drills are commonly mounted on trucks, tracked carriages, and articulated "buggies" with large, low-pressure tires. Small, portable drills capable of drilling to depths greater than 400 meters can be transported using mules and even manually (see Photo 3-1). Core drill rigs can be very versatile: "Diamond drill rigs can be transported, assembled, and placed on "pads" by using primitive trails and by helicopter" (Peters 1987).

In diamond core drilling, the cylindrical core is cut by a donut-shaped bit having a cutting surface (the "donut") with embedded diamonds. The core is recovered in the inner tube of the core barrel and brought to the surface. The fluid used to lubricate the bit, carry the drill cuttings to the surface, and stabilize the hole walls is usually water with a weighting agent mud (bentonite) and sometimes other additives (cottonseed hulls, cellulose, soap, etc.).

Reverse-circulation drills are generally heavy and can drill only near-vertical holes (Peters 1987). Rock chips from the bottom of the hole are recovered in the fluid stream rising in the center of a double-wall drill pipe – the reverse of the normal drilling

circulation path (Photo 3-1) These drills are generally transported on trucks, track, and buggy type vehicles (see photos 3-2, 3-3, 3-4 and 3-6).

Site requirements for drills vary depending primarily on size and the type of carrier. Truck-mounted drills generally require the largest drill "pad" – generally 500 ft^2 or more. They must be relatively level, which on steep slopes can mean a considerable amount of construction work is necessary. Drill holes are commonly sited on roads to minimize disturbance and reduce costs.

Track and buggy-mounted drills are generally capable of operating on steeper slopes without constructing large pads ($\leq$500 ft^2) (see photos 3-2, 3-3, 3-4 and 3-6). Smaller level areas are still needed to locate mud tanks and provide work areas to log core and chips. Much less construction is generally needed, however.

Smaller portable rigs with limited depth capability (Photo 3-6) are often moved by helicopter, pack stock, and by hand. No road construction is needed. Small (six-to-ten ft^2) areas are needed to place hydraulic pumps, generators, etc. Pads ($\leq$100 ft^2) often consist of wood platforms, allowing drill holes to be sited on extremely steep slopes or in environmentally sensitive areas with almost no need to actually set foot on the ground surface. Drilling costs using manually portable drills are competitive when considering the expense of road construction or reconstruction and the associated cost of mitigation and bonding. For a small diamond-drilling program at the Golden Hand site the estimated cost is $24 per foot (Davidson, pers comm.).

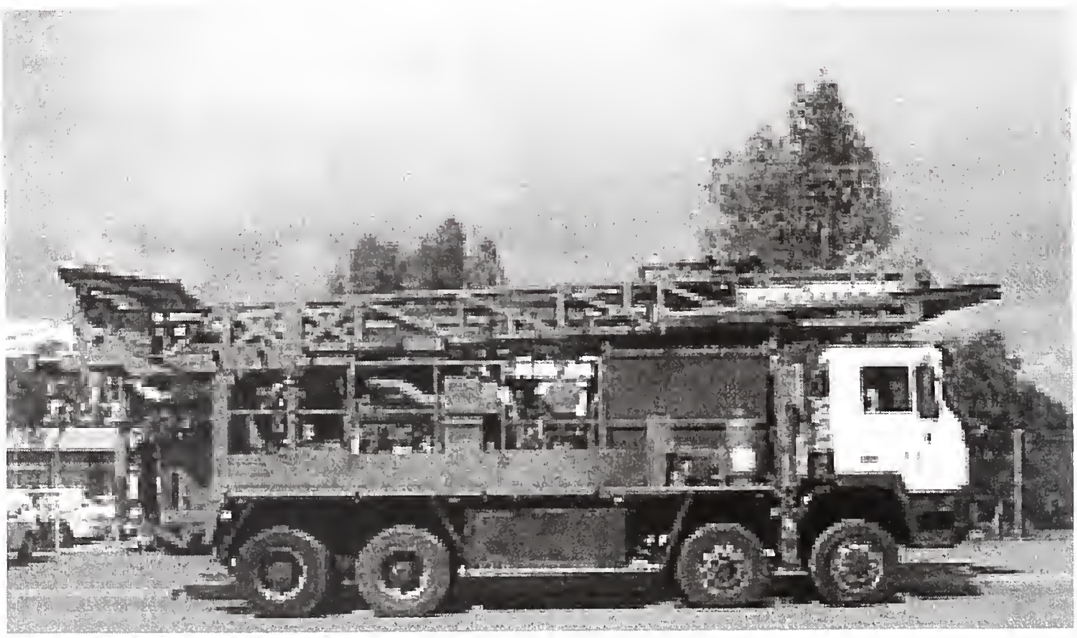


Photo 3-2. Truck-mounted reverse circulation drill.

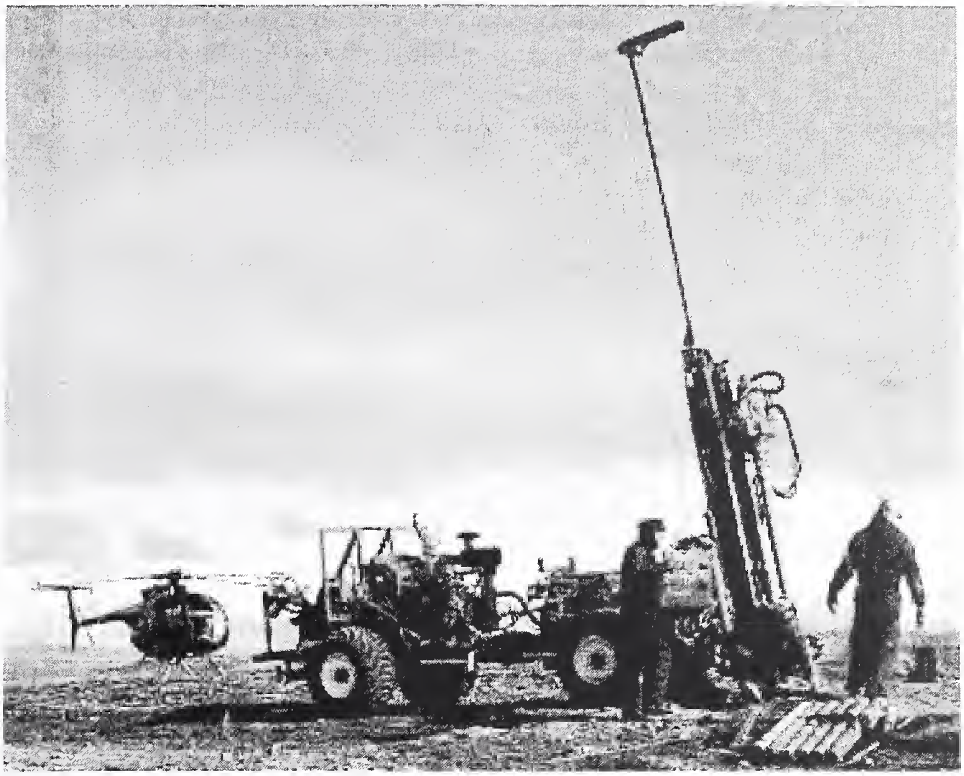


Photo 3-3. Buggy mounted reverse circulation drill.

Photo 3-4. Track-mounted reverse-circulation rotary drill.

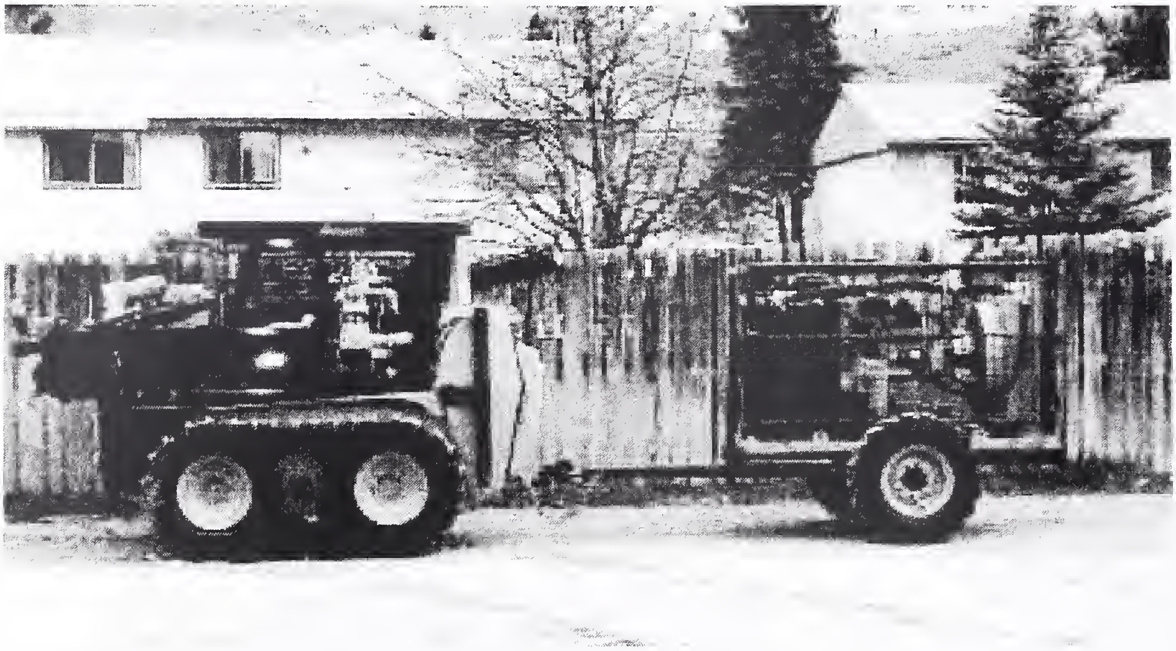


Photo 3-5. Track-mounted, top drive rotary drill.

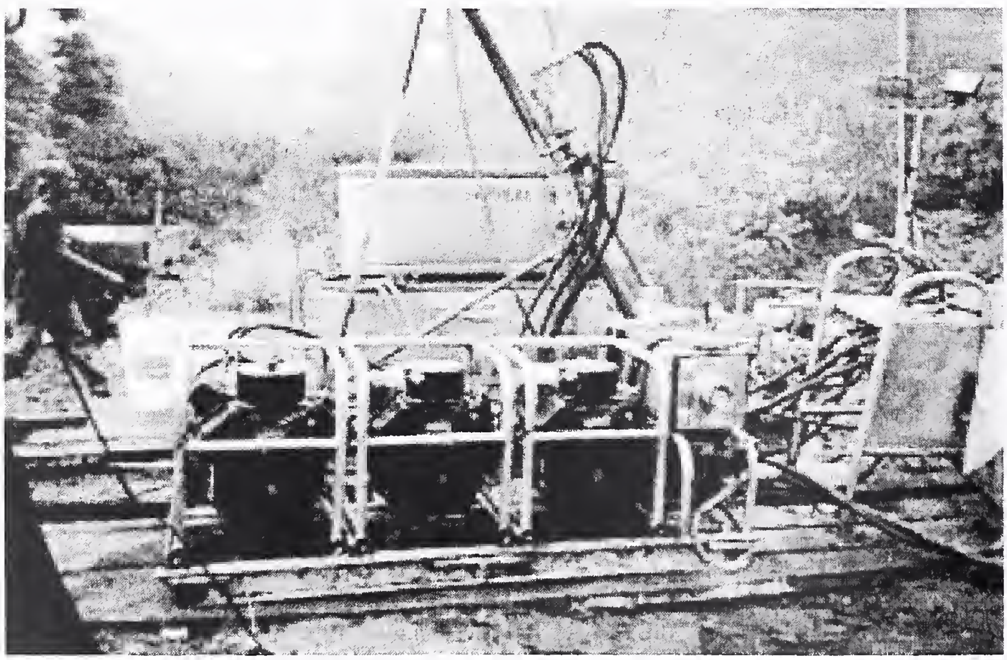


Photo 3-6. Manually portable diamond drill.

Trenching

Trenching would be used to extract "bulk samples for metallurgical testing" (Ivy 2002c). Trenches are generally excavated using large equipment, such as backhoes and tracked excavators, and the use of explosives may be necessary. Trenches can provide fresh exposures where vegetation or colluvium obscures lithology or geologic contacts. They can provide access to ore for sampling if they can be located accurately.

Activities Reasonably Incident to Mining. Are the activities in the alternatives reasonably incident to mining?

The Surface Resources Act of July 23, 1955, (30 USC 611, *et seq*.) provides limitations on the use of the surface of mining locations on lands open to operations under the General Mining Law (30 USC 22, *et seq*.). Section 4 of the Act directs that any unpatented mining claim "... shall not be used, prior to issuance of patent therefore, for any purposes other than prospecting, mining or processing operations and uses reasonably incident thereto."

Activity or facilities that are reasonably incident will vary depending on the stage of mining activity. Through case law that has evolved since 1955, the reasonably incident standard has been interpreted to include only activities or facilities that are an integral, necessary, and logical part of an operation whose scope justifies the activities or facilities.

Activities that are reasonably incident would be expected to be closely tied to, and be defined within, what would be reasonable and customary for a given stage of mining activity. Such levels of activity would include initial prospecting, advanced exploration, predevelopment, and actual mining. Each stage is defined by an increasing level of data and detail on the mineral deposit that, in total, contribute to an increasing probability that the deposit can be mined profitably. Each stage also has an increasing impact on the land.

While Congress restricted use of the surface on unpatented claims to uses reasonably incident to mining, in 1974 the Secretary of Agriculture promulgated regulations applicable to processing proposals for use of the surface that is reasonably incident to mining on NFS lands. All mining activity on NFS lands open to operations under the General Mining Law, regardless of the nature and extent, are administered by the Forest Service through these mining regulations at Volume 36 of the Code of Federal Regulation, Part 228 A (36 CFR 228A). Part 36 CFR §228.8 specifically requires that "All operations shall be conducted so as, where feasible, to minimize adverse environmental impacts on National Forest surface resources ...". The regulations were promulgated in part under authority of the Forest Service Organic Act (16 USC 473, *et seq*.) that, among other things, directed the Secretary of Agriculture to make such rules on NFS land as necessary "to regulate their occupancy and use and to preserve the forests thereon from destruction..."

Reasonably incident refers to any use of the National Forests for purposes that reflect sound practices necessary or required for the various stages of mining activities, including prospecting, mining, or processing operations. This might involve such uses as access, equipment storage, structure use or construction, excavations, mine dumps, tailings disposal, and other surface disturbances.

For a use to be reasonably incident, the type and level of use must be justified as being appropriate to the stage of mining activity in which the operation is legitimately engaged (i.e., prospecting, exploration, development, production, abandonment, or reclamation). In turn, the stage of mining activity with the related use must be required, justified, and appropriate, based on the nature and extent of the mineral resource present. Generally, the more information available about the quality and quantity of a mineral resource and the closer an operator comes to delineating minable reserves, the more advanced the stage of mining activity and use and the more extensive the surface impacts that are reasonable and justified.

A logical part of this concept is that a surface disturbing activity that is restricted to disturbances reasonably incident to mining will therefore only involve necessary and reasonable disturbance of

surface resources. Conversely, any activity that does not minimize adverse environmental impacts by avoiding unnecessary and unreasonable destruction of surface resources and damage to the environment is NOT reasonably incident to mining activities.

To aid in the analysis of which activities in the proposed operating plan are reasonably incident to mining, the PNF requested the assistance of the Intermountain Region Mineral Examiner. The Mineral Examiner prepared a Surface Use Analysis (SUA) (Abbay 2003, Appendix B). The SUA provided the information to determine which proposed activities are reasonably incident. The following activities were analyzed:

- Access
- Occupancy
- Mineral Development
- Water Developments

Access

Forest Plan (1988, as amended) direction regarding access includes: "“Mining development roads shall be constructed and maintained to assure adequate drainage and to minimize or, where practicable, eliminate damage to soil, water, and other resource values. Mitigation measures and seasonal maintenance practices for mining access roads should be part of the operating plan” (p. IV-101). Direction in the minerals section of the FC-RONR Wilderness Plan (1985, as amended) states: “Reasonable access cannot be denied, but should be located to have the least long lasting impact on Wilderness values…”

The operating plan submitted by AIMM proposes to maintain the road between Edwardsburg and Pueblo Summit (Forest Roads 371 and 373). Beginning at Pueblo Summit, FS Trail #013 would be improved to allow drill rigs, support vehicles, and other vehicles described in Alternative B to access the mine site. To access drill sites and trench locations, roadbeds from old exploration and mine roads would be constructed, along with new roads on and off the claims.

Because providing access can be the most expensive component of a drilling project and is generally responsible for the greatest environmental effects, many access options are usually considered. Minimizing or eliminating the construction of roads is often preferable for both cost and environmental reasons. Overland travel, requiring track or buggy-mounted drills is less expensive than constructing new roads. Trees often must be removed, but allowing the rest of the vegetation to remain is beneficial as it helps prevent sediment movement and is visually preferable. In addition, the reestablishment of vegetation often occurs at a faster pace, which further reduces reclamation costs.

Occupancy

Occupancy, whether involving the construction or use of a permanent structure or camping beyond normal “stay limits”, must be authorized in a plan of operations under 36 CFR 228 A. Failure to do so is a violation of Forest Service regulation at 36 CFR 261.10(a) and (b). In *United States v. Burnett*, 750 F.Supp. 1029, 1035 (D. Idaho 1990), the Court held that the maintenance of structures "under the Forest Service's current policies and the law of this circuit, is a significant surface disturbance which requires an operating plan."

Golden Hand No's. 3 and 4 claims are located within the congressionally designated FC-RONR Wilderness. Both the 1964 Wilderness Act (16 USC 1121, *et seq.)* and the 1980 Central Idaho Wilderness Act (P.L 96-312) provide for the exercise of established valid existing rights. Only claims No. 3, 4, and 8 have established valid existing rights. CFR 228.15(a) states "the United States mining laws shall extend to each National Forest Wilderness for the period specified in the Wilderness Act and subsequent establishing legislation to the same extent they were applicable prior to the date the Wilderness was designated by Congress as a part of the National Wilderness Preservation System. Subject to valid existing rights, no person shall have any right or interest in or to any mineral deposits which may be discovered through prospecting or other information-gathering activity after the legal date on which the United States mining laws cease to apply to the specific Wilderness. After the withdrawal date, per the Wilderness Act, the mining laws (and attendant rights to use the surface) no longer apply to the wilderness surface where there are no valid existing rights.

Therefore the regulations at CFR 228A, which only regulate 1872 Mining Law activities, cannot be used to authorize ancillary facilities not on valid claims in wilderness. The regulations at CFR 228A only apply to approve the access to the valid claims and the exercise of rights within the surface and subsurface boundaries of the valid claim (including pursuit of extralateral rights). Occupancy cannot be considered except on claims with established valid existing rights.

Forest Service policy on management of designated Wilderness is also clear in this matter. Constructing, placing, or maintaining any structure in Congressionally designated Wilderness is generally prohibited unless provided for in the enabling legislation or through established valid existing rights.

The buildings AIMM has proposed for use in their operating plan are property of the United States Government and are not on mining claims with established valid existing rights. Construction of an access road to claims with established valid existing rights, construction of on-claim roads, diversion of water on-claim, and occupancy on claim can be approved under CFR 228A. Off-claim activities can only be approved, if at all, through issuance of special use permits.

Mineral Development

For a discussion of "reasonably incident" see pages 2-4 and 2-27 of the Surface Use Analysis (Abbay 2003) (Appendix B).

Water Developments

Off-claim activities can only be approved, if at all, through issuance of special use permits. New diversions within Congressionally designated Wilderness (off claim) require Presidential authorization under 16 USC 1133(d)(4)(1).

Compliance with PACFISH Minerals Standards and Guidelines

The effects to this indicator 3 will be measured under the provisions for compliance in the section on PACFISH Minerals Standards and Guidelines shown previously in the section entitled "Management Direction".

Environmental Effects

The Surface Use Analysis (SUA) (Abbay 2003) prepared by the Intermountain Region Mineral Examiner provided information to help determine which activities in the proposed operating plan are reasonably incident to mining. The SUA was also used to analyze the geologic information to be obtained under the four alternatives. The SUA is included in Appendix B and all references to Abbay 2003 also refer to Appendix B.

Geologic Information to be Obtained

Alternative A

Under the No Action alternative AIMM would be able to complete the following work without a plan of operations approved by the Forest Service:

1. Prepare more detailed geologic mapping
2. Conduct additional, non-surface disturbing soil and lithogeochemistry sampling
3. Conduct non-surface disturbing geophysical traverses

Alternative A would not allow AIMM the opportunity to obtain a portion of the geologic information they have stated is necessary to "fully delineate the mineral deposits" (Ivy 2002c):

4. Drill boreholes to determine the spatial position of the deposit in three dimensions
5. Trench to obtain bulk samples for metallurgical testing

AIMM had the opportunity to complete these tasks in the past but was not willing to expend the funds without authorization to undertake a more extensive program of work.

Alternative B

Implementation of Alternative B would allow the proponents to complete the work they have stated is necessary to "fully delineate the mineral deposits" (Ivy 2002c).

1. Prepare more detailed geologic mapping
2. Conduct additional, non-surface disturbing soil and lithogeochemistry sampling
3. Conduct non-surface disturbing geophysical traverses
4. Drill boreholes to determine the spatial position of the deposit in three dimensions
5. Trench to obtain bulk samples for metallurgical testing

AIMM has stated that "Our 1996 Operating Plan states the full scope of work we believe necessary to fully delineate the ore bodies on the claims" and that the plan will generate the information necessary "to the preparation of a production mining and processing plan" (Ivy 2002c). In AIMM's proposal, however, only one drill location (12) is in the area of the indicated/inferred reserves (see Figure 3-2). The remaining drill locations are outside that area and are relatively random in nature. While random sampling "has a place in exploration…it does not provide the coverage needed for actually defining an orebody" (Peters 1987). A systematic grid of samples taken normal to the ore zone is the preferred pattern" (ibid). Well-placed drill holes would provide information useful in determining the presence and extent of mineralization, and information relative to geology and geologic structure (Abbay 2003).

As discussed in the Surface Use Analysis (Abbay 2003, Appendix B), trenches can provide useful information if located after drilling has provided subsurface data on lithology, structure, and mineralization. None of the proposed trenches are in areas of known mineralization and are outside the geologic structure defined by Ohara in the 1988 hearing before Administrative Law Judge Ramon Child (Abbay 2003) (see Figure 3-1). Trench samples would provide little useful information until the extent of mineralization is determined and trenches can be located appropriately. If drilling delineates sufficient ore, bulk samples could help determine the most effective mining and milling techniques.

Alternative C

Implementation of Alternative C would allow the proponents to complete the following work they have stated is necessary to "fully delineate the mineral deposits" (Ivy 2002c):

1. Prepare more detailed geologic mapping
2. Conduct additional, non-surface disturbing soil and lithogeochemistry sampling
3. Conduct non-surface disturbing geophysical traverses
4. Drill boreholes to determine the spatial position of the deposit in three dimensions.

AIMM would be able to complete their work items No. 1-4, but not No. 5. Trenching is a common practice when sited at points where data can be meaningful. To date that does not appear to be the situation, as described above and analyzed in the SUA (Abbay 2003). Trenching is also considered to have the greatest potential to affect surface resources. Consequently, in Alternative C, no trenching would occur. While trenching would not be approved under this alternative, it is not precluded if drilling delineates sufficient ore.

In Alternative C, drilling would be sequenced beginning with sites 11, 12, 13, 21, 22, and 23. If the results of the first stage drilling found geologically important intercepts, a second phase of drilling activity incorporating additional sites would take place up to the 31 locations AIMM has stated they need.

Alternative D

Implementation of Alternative D would allow the proponents to complete the following work they have stated is necessary to "fully delineate the mineral deposits" (Ivy 2002c):

1. Prepare more detailed geologic mapping
2. Conduct additional, non-surface disturbing soil and lithogeochemistry sampling
3. Conduct non-surface disturbing geophysical traverses
4. Drill boreholes to determine the spatial position of the deposit in three dimensions.

Alternative D would not approve the entire extent of the drilling as identified by AIMM, but it would provide the information needed to verify ore grade mineralization in the area of indicated/inferred reserves around the Glory Hole (Abbay 2003). The program could be conducted in a reasonable period of time (2-3 years). The drilling sequence in Alternative D focuses on drilling conducted in a logical sequence beginning in the indicated-inferred reserve block to verify reserves and proceeding outward to track extensions of the deposit, if any" (Abbay 2003). Manually portable drills would be used to minimize surface disturbance and effects to resources. Drills and support equipment and supplies would be transported with pack stock and by hand.

This alternative would be sequenced in the following manner:

- Drill at sites 11, 12, 13, 21, 22, and 23 and at an additional 6 to 8 sites in the area of the 250-foot long by 210-foot wide body of "known" indicated/inferred reserves around the Glory Hole. This array would test the interior and perimeter of the deposit.

Activities Reasonably Incident to Mining

Alternative A

Non-surface disturbing activities such as those allowable under Alternative A are considered baseline data collection and would be reasonably incident to mining. Access would be on foot or by pack stock. No long-term residential occupancy or water developments would occur.

Alternative B

Access

Access to the project area is necessary because without access, drilling, one of the next logical exploratory steps to evaluate the deposit cannot take place, but the type of access that is reasonable is dependent on a variety of considerations (see discussion under other resource sections). Under Alternative B, motorized access would not meet Forest Plan direction. Maintenance of existing roads and new drill road construction should be keyed to drilling when drilling is reasonably incident to mining. As analyzed in the SUA, drilling and necessary roadwork should be sequenced to reduce unnecessary impacts. Additionally, where alternatives exist in equipment suitable for drilling, equipment needing the least impacting means of access should be chosen (Abbay 2003, Appendix B). Sequencing of drill sites and access using the least impacting means is not proposed in Alternative B.

Occupancy

AIMM has proposed to use the existing bunkhouse at the Golden Hand mine site as housing for an estimated six individuals. Restoring the building to a safe and habitable condition is estimated to cost approximately $55,000 (Hersel 2002) (not accounting for costs associated to restore the bunkhouse as a historic resource). The use and improvement of the bunkhouse would be a convenience not necessary to the health, safety, or well being of the workforce. Others working in the backcountry in timber or other endeavors plan, live, and work with the uncertainties inherent in such work during a short field season (Abbay 2003).

The bunkhouse is a surface resource subject to use under an approved plan of operations if it is reasonably incident to mining and on a mining claim with valid existing rights. The bunkhouse is not located on a mining claim with valid existing rights and it's use is not reasonably incident to mining within the scope of AIMM's proposed plan (Abbay 2003).

Mineral Development

AIMM's proposed plan of operations incorporates uses of the surface that are generally reasonable and customary to exploring and developing mineral deposits during different stages of

development. Not all uses, however, are necessarily reasonably incident to mining on claim No's. 3 and 4 at the present time based on available information from AIMM, the IBLA decision, Forest files, and the approach one would expect from a prudent mining company (Abbay 2003).

The use of the surface on claim No's. 3 and 4 for drilling is reasonably incident to mining when the drilling is logically sequenced. Until the Glory Hole's indicated/inferred reserves are verified by in-fill drilling and supplemental sampling underground, the use of the surface at all drill sites other than 11, 12, 13, 21, 22, and 23 (and the area immediately around the inferred ore deposit) is not reasonably incident to mining (Abbay 2003).

Use of the surface for trenching is not reasonably incident to mining at this time. Trenching should be deferred until drilling verifies the deposit and confirms that the deposit extends to the surface and subsurface of the areas proposed for trenching (Abbay 2003).

The limited underground work in Alt B would result in minimal impact to surface resources and would be reasonably incident to mining (Abbay 2003).

Water Development

Alternative B states "water will be conducted to the camp and work sites through plastic pipe laid on the ground with the end of the pipe laid in a creek. No ditches or creek dams are anticipated." AIMM has stated they "may acquire...domestic water rights, which are exempt from permitting and filing requirements." According to the Idaho Department of Water Resources, the right to use surface water is established through the application/permit/license procedure under Idaho Statute Title 42. The diversion of water on a mining claim with valid existing rights is authorized through the regulations at CFR 228A. New diversions within Congressionally designated Wilderness (off claim) require Presidential authorization under 16 USC 1133(d)(4)(1). The actual water source has not been specified, but if AIMM proposed to use a source that required a diversion not located on claims 3 and 4, an additional environmental analysis and decision document based on Presidential approval would be necessary.

Alternative C

Access

The use of the surface on claims No's. 3 and 4 for... drill access, and access for ancillary support equipment is reasonably incident to mining when the drilling is logically sequenced (Abbay 2003), as proposed in Alternative C. Motorized access under Alternative C would meet Forest Plan direction for Minerals (see description in Chapter 2). In particular it would minimize unnecessary impacts to surface resources through inclusion of reasonable environmental protection measures. Motorized access would not meet all Forest Plan direction as amended by PACFISH (see Compliance with PACFISH direction for Minerals). Motorized access is not the least impacting means of access (see discussion under Soil and Water Resources and Fisheries Resource sections). Use of Best Management Practices (Appendix D) would greatly reduce the potential impacts of roads and motorized access.

Material for road maintenance and road improvements on FR 371 and 373 would be obtained from an existing waste rock dump at the Werdenhoff Mine. Forest Service regulation at 36 CFR 228C allows the agency to provide common variety minerals to miners under a free-use permit.

Provisions may be made for reclamation requirements and the collection of a reclamation bond if determined necessary by the Forest Service.

Occupancy

Residential occupancy would not occur under this alternative because it is not reasonably incident as discussed above under Alternative B.

Mineral Development

The drilling proposed under Alternative C is reasonably incident to mining because it is logically sequenced, beginning in the area of the inferred ore deposit (Abbay 2003). It would allow most of AIMM's proposed development activities using a sequenced implementation schedule and modifications to minimize adverse environmental impacts (Figure 2-2). Drilling progress would be monitored and sample assay results shared with the PNF in order to verify data and, with the operator, determine what further activity would be reasonably incident to mining.

Mitigation measures would be included to minimize the potential effects from drilling (see Appendix D). These measures include (but are not limited to) the following:

- Drill holes indicated on the map (Figures 2-2, 3-3) are approximate only. Exact drill pad location would be approved and flagged on the ground by the Forest Service.
- The risk of accidental or emergency discharge would be mitigated by providing emergency containment for drilling fluids.
- Drilling fluids would be water-based and subject to Forest Service approval.

Measures also address disposal of drilling fluids, and drill pad construction and reclamation.

No trenching would occur because it is not considered reasonably incident at this time, as discussed above under Alternative B.

The modest underground exploratory program AIMM has outlined in their plan is reasonably incident to mining and would create little impact to surface resources. Reopening and clearing adits would allow data collection valuable to formulating a more complete geological and reserve analysis (Abbay 2003).

Water Development

The use of water under this alternative as described in Chapter 2 is necessary, reasonable, and complies with state and federal law and regulation.

Alternative D

Access

The use of the surface on claims No's. 3 and 4 for… drill access, and access for ancillary support equipment is reasonably incident to mining when the drilling is logically sequenced (Abbay 2003), as proposed in Alternative D. This alternative requires non-motorized access, but would allow the use of specified mechanized equipment such as drilling rigs. This access would minimize unnecessary impacts to surface resources through inclusion of reasonable environmental protection measures. Non-motorized access would meet all Forest Plan direction as amended by PACFISH (see Compliance with PACFISH direction for Minerals) and is the least

impacting means of access (see discussion under Soil and Water Resources and Fisheries Resource sections).

Material for road maintenance and road improvements on FR 371 and 373 would be obtained as described under Alternative C.

Occupancy

A temporary camp would be approved at a site on Golden Hand claim No. 3 or No. 4. Under Alternative D, access to the mining claims would be by foot or pack stock; hence a temporary camp would be reasonable and customary, similar to camps approved for outfitters and guides.

Mineral Development

The use of the surface on claims No's 3 and 4 for drill sites, drill access, and access for ancillary support equipment is reasonably incident to mining when the drilling is logically sequenced (Abbay 2003). Until the Glory Hole's indicated/inferred reserves are verified by in-fill drilling and supplemental sampling underground, the use of the surface at all drill sites other than 11, 12, 13, 21, 22, and 23 is not reasonably incident to mining. Such use of the surface at other sites would not be based on geological information that would reasonably support AIMM's need and justify the associated disturbance to surface resources (Abbay 2003).

Mitigation measures would be included to minimize the potential effects from drilling as described above in Alternative C and in Appendix D

No trenching would occur because it is not considered reasonably incident at this time, as discussed above under Alternative B.

The modest underground exploratory program AIMM has outlined in their plan is reasonably incident to mining and would create little impact to surface resources. Reopening and clearing of adits would allow data collection valuable to formulating a more complete geological and reserve analysis.

Water Development

The use of water under this alternative as described in Chapter 2 is necessary, reasonable, and complies with state and federal law and regulation.

Compliance with PACFISH Minerals Standards and Guidelines

Each of the alternatives allows for different amounts and types of activities (such as road construction, drilling, and trenching) in Riparian Habitat Conservation Areas (RHCAs) with varying compliance with PACFISH standards and guidelines. Figures 3-2 through 3-4 display PACFISH RHCAs on maps of the activities that would occur on the claims. Table 3.1 summarizes the alternatives compliance with PACFISH direction as determined from information provided in the Fisheries Resource section and the Soil and Water Resources section.

Table 3-1. Direct and Indirect Effects of Indicators by Alternative

Indicator	Alt. A	Alt. B	Alt. C	Alt. D
Geologic information likely to be obtained				
Drill locations occupied (>1 drill hole per location possible)	0	31 sites (48 drill holes)	31 sites (48 drill holes)	14 sites
Surface information obtained	-Mapping -Sampling -Geophysical surveys	-Mapping -Sampling -Geophysical surveys	-Mapping -Sampling -Geophysical surveys	-Mapping -Sampling -Geophysical surveys
Subsurface information obtained	-Underground mapping & sampling	-Drill data -Underground mapping & sampling -Trenching	-Drill data -Underground mapping & sampling	-Drill data -Underground mapping & sampling
Project duration	NA	10 years	3-5 years	3-5 years
Reasonably incident activities	Yes	No	Yes	Yes
Compliance with PACFISH Standards and Guidelines for minerals projects				
MM-1. Avoid adverse effects to listed species and…habitat from mineral operations. If NOI indicates a mineral operation would be located in a RHCA, or could affect attainment of RMOs, or adversely affect listed anadromous/inland native fish, require a reclamation plan, approved Plan of Operations… and reclamation bond….Ensure Reclamation Plans contain measurable attainment and bond release criteria for each…activity.	Avoids adverse effects: no surface disturbing activities approved	Does not avoid adverse effects because mitigation measures are inadequate. Requires a plan of operations, reclamation plan, and bond – may be insufficient for RMO attainment	Avoids most adverse effects: mitigations minimize negative effects, road work improves water quality and fish habitat. Requires adequate reclamation plan and bond	Avoids adverse effects: no roads would be constructed, mitigation measures are used, road work improves water quality and fish habitat. Requires adequate reclamation plan and bond
MM-2. Locate structures, support facilities, and roads outside RHCAs. Where no alternative to sitting facilities in RHCAs exists, locate and construct the facilities in ways that avoid impacts to RHCAs and streams and adverse effects on … fish. Where no alternative to road construction exists, keep roads to minimum necessary for the approved mineral activity. Close, obliterate, and revegetate roads no longer required…	Complies: No significant surface disturbing activities approved	Does not comply: Roads, drill sites, trenches constructed within RHCAs. Bunkhouse and outhouse proposed for use are located within a RHCA. Lacks sufficient mitgation measures and road obliteration	Complies: Road construction on old roadbeds and drill sites located within RHCAs includes mitigation measures to avoid adverse effects. Includes plans for road obliteration	Complies: only facilities located within RHCA's are drill sites occupied by manually portable drills and platforms. Includes mitigation measures and plans for road obliteration

Indicator	Alt. A	Alt. B	Alt. C	Alt. D
MM-3. Prohibit solid and sanitary waste facilities in RHCAs	Complies: No solid or sanitary waste facilities would be approved	Does not comply: Uses existing outhouse in RHCA	Complies: No solid or sanitary waste facilities located in RHCAs	Complies: No solid or sanitary waste facilities located in RHCAs
MM-5. Permit sand and gravel mining and extraction within Riparian Habitat Conservation Areas only if no alternatives exist	Complies: No sand and gravel extraction would occur	Does not comply: Material for roadwork obtained from existing road cuts. Some of these locations could be within RHCAs	Complies: Material for road work obtained from an existing waste rock dump at the Werdenhoff Mine outside of a RHCA	Complies: Material for road work obtained from an existing waste rock dump at the Werdenhoff Mine, outside of a RHCA
MM-6. Develop inspection, monitoring, and reporting requirements	Not applicable - No plan of operations required, so no formal monitoring plan would be developed	Complies in part: A monitoring plan is not proposed by AIMM, but would be developed by the FS, along with inspection and monitoring requirements	Complies: A formal monitoring plan would be developed, along with inspection and monitoring requirements	Complies: A formal monitoring plan would be developed, along with inspection and monitoring requirements

Cumulative Effects

The following ongoing and reasonably foreseeable actions in the analysis area were considered for the cumulative effects on mineral development:

- Ongoing operations at Walker Millsite
- Proposed exploration work on Golden Hand lode mining claims No's. 1 and 2

Only these activities would be expected to have effects that may be cumulative with the effects to mineral development described in this DEIS. Effects on other existing mining properties in the Edwardsburg/Big Creek area is deemed to be negligible because AIMM's proposed operating plan is exploratory in nature and not likely by itself to inordinately encourage other activity on other mining properties. Cumulative effects were tracked relative to the indicators of geologic information obtained, activities reasonably incident to mining, and compliance with PACFISH direction for minerals.

Alternative A

The cumulative effect of Alternative A on the mineral development is limited to the level of geologic information obtained that could be obtained without a formal operating plan. There

would be no cumulative effects with operations of the Walker Millsite or exploration work on claims 1 and 2.

Action Alternatives

Five mining claims are located in the Beaver Creek watershed; three of which (Golden Hand No's. 3, 4, and 8) have valid existing rights. Exploration work at claims 1 and 2 would increase the area in which AIMM obtained general geologic information but would not increase AIMM's knowledge of the inferred ore deposit on claims 3 and 4. The information obtained from implementation of any action alternative on claims 3 and 4 is not likely to have any effect on the exploration work at Golden Hand claims 1 and 2.

Selection of a specific action alternative may be considered to have implications on the determination of future activities reasonably incident to mining on claims 1 and 2, but, in fact, any evaluation of activities reasonably incident to mining should be made separately for each proposed plan, based on the current geologic information and stage of development.

If data justified opening a mine, impacts both temporary and cumulative would be addressed in conjunction with a new mining proposal from AIMM. The scope of such a plan is not reasonably foreseeable at this time because the extent of the mineral deposit is not known nor can be reasonably inferred. In addition, AIMM's has stated it would take 10 years to accomplish the current proposed plan of operations. An operating mine would not be reasonably before the current proposed work is accomplished.

Transportation of bulk samples for the Golden Hand lode mining claims to the Walker Millsite for testing would have no cumulative effects on the millsite operations. Operations at the Walker Millsite are ongoing and the samples could be tested there or at other locations without any cumulative difference on geologic information obtained or reasonably incident activities.

Alternative B and Alternative C do not comply with PACFISH direction to varying degrees. Noncompliance with PACFISH would be cumulative with any activities at the Walker Millsite or claims 1 and 2 that also do not comply. Current direction for operations at the Walker Millsite is designed to comply with PACFISH direction.

Irreversible and Irretrievable Commitments

Under the No Action Alternative, there would be no irreversible and irretrievable commitment of the mineral resource. Under the action alternatives, there would be no irreversible or irretrievable commitment of the mineral resource, because the current proposal does not include the production and beneficiation of ore.

Forest Plan Consistency

Alternatives C and D are consistent with Forest Plan standards and guidelines for minerals management. Alternative B would not be consistent with the following direction:

- Unnecessary impacts to surface resources will be minimized through inclusion of reasonable environmental protection measures in the operating plan. Forest Service mining regulations at section 228.8 specify measures applicable to surface resources, particularly air quality, water quality, solid wastes, scenic values, fisheries and wildlife habitat…(p. IV-99).

- All practicable measures shall be employed to maintain and protect fisheries and wildlife habitat which may be affected by the operations…(p. IV-100).

- Mining development roads shall be constructed and maintained to assure adequate drainage and to minimize or, where practicable, eliminate damage to soil, water, and other resource values. Mitigation measures and seasonal maintenance practices for mining access roads should be part of the operating plan…Roads no longer needed should be closed to vehicular traffic;…cross-drains, dips, or water bars constructed; and the road surface shaped to as near natural contour as practicable and stabilized (p. IV-101).

- A permanent acceptable ground cover….must be provided…acceptable species must contribute to species diversity, be non-noxious, and be approved by the Forest Service (p. IV-101).

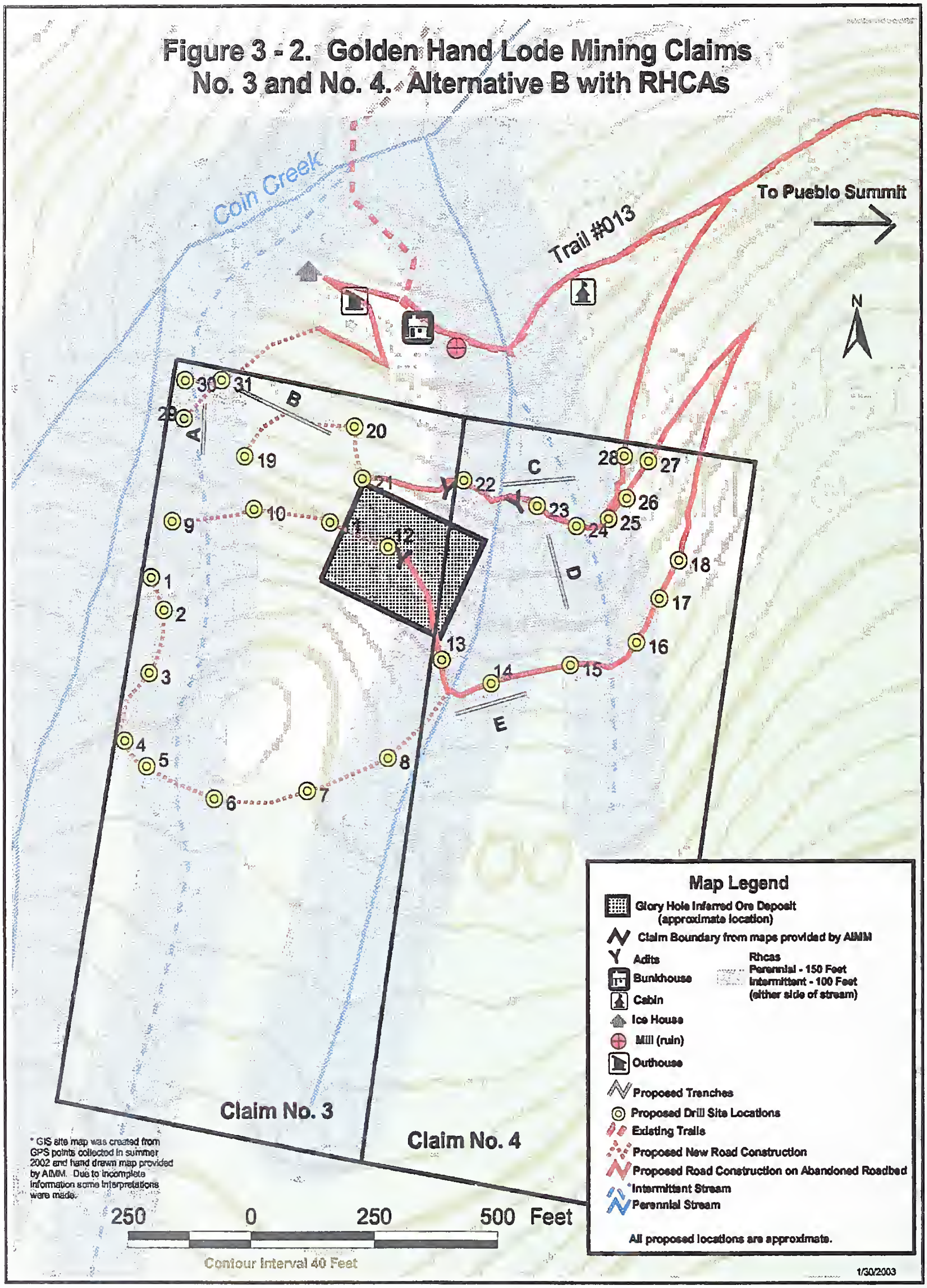


Figure 3 - 2. Golden Hand Lode Mining Claims
No. 3 and No. 4. Alternative B with RHCAs
Coin Creek
Trail #013
To Pueblo Summit
N
A
B
C
D
E
1
2
3
4
5
6
7
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11
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13
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15
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17
18
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20
21
22
23
24
25
26
27
28
29
30
31
Claim No. 3
Claim No. 4
* GIS site map was created from GPS points collected in summer 2002 and hand drawn map provided by AIMM. Due to incomplete information some interpretations were made.
250 0 250 500 Feet
Contour Interval 40 Feet
Map Legend
Glory Hole Inferred Ore Deposit (approximate location)
Claim Boundary from maps provided by AIMM
Adits
Bunkhouse
Cabin
Ice House
Mill (ruin)
Outhouse
Rhcas
Perennial - 150 Feet
Intermittent - 100 Feet
(either side of stream)
Proposed Trenches
Proposed Drill Site Locations
Existing Trails
Proposed New Road Construction
Proposed Road Construction on Abandoned Roadbed
Intermittent Stream
Perennial Stream
All proposed locations are approximate.
1/30/2003

Figure 3 - 3. Golden Hand Lode Mining Claims No. 3 and No. 4. Alternative C with RHCAs

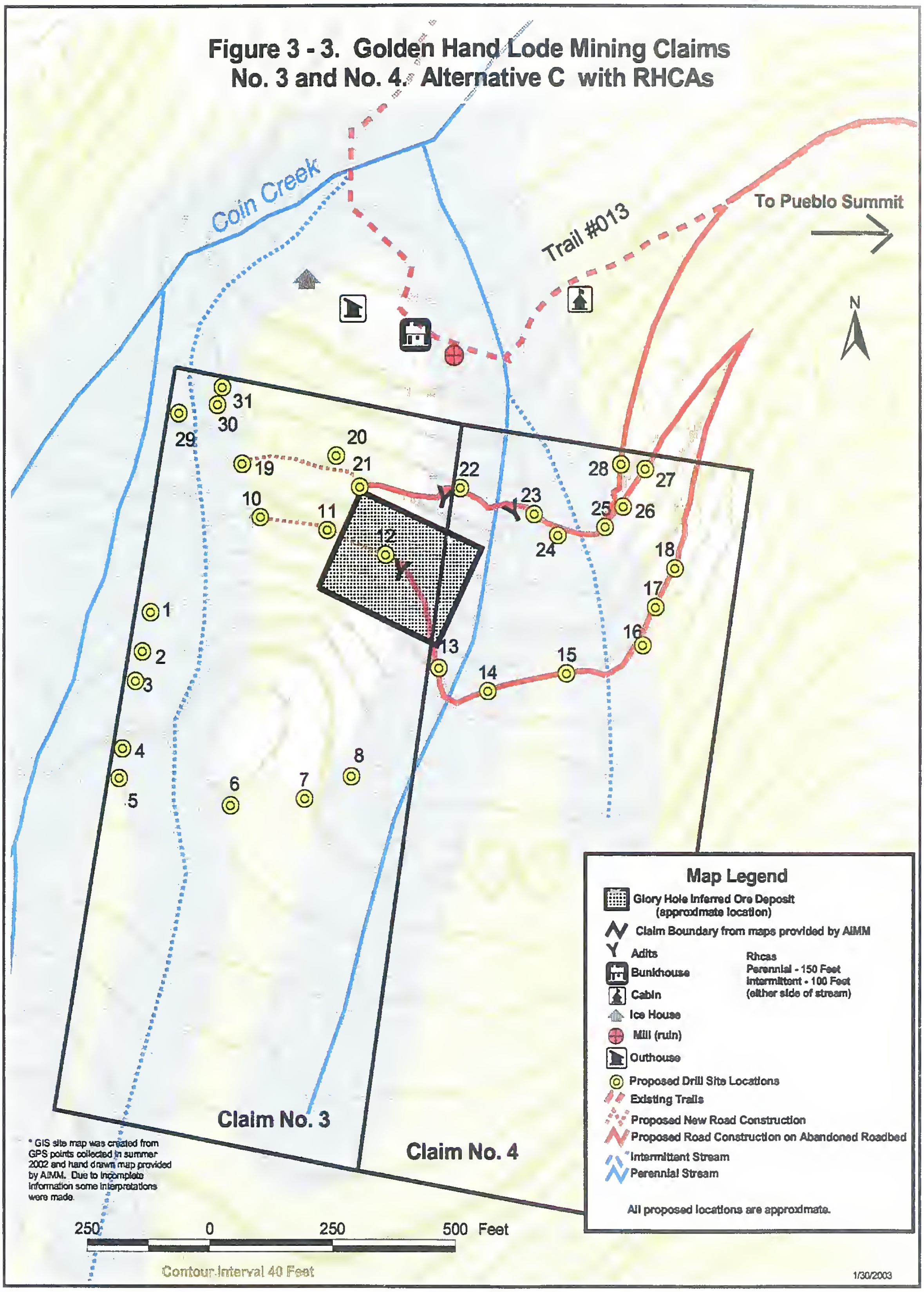
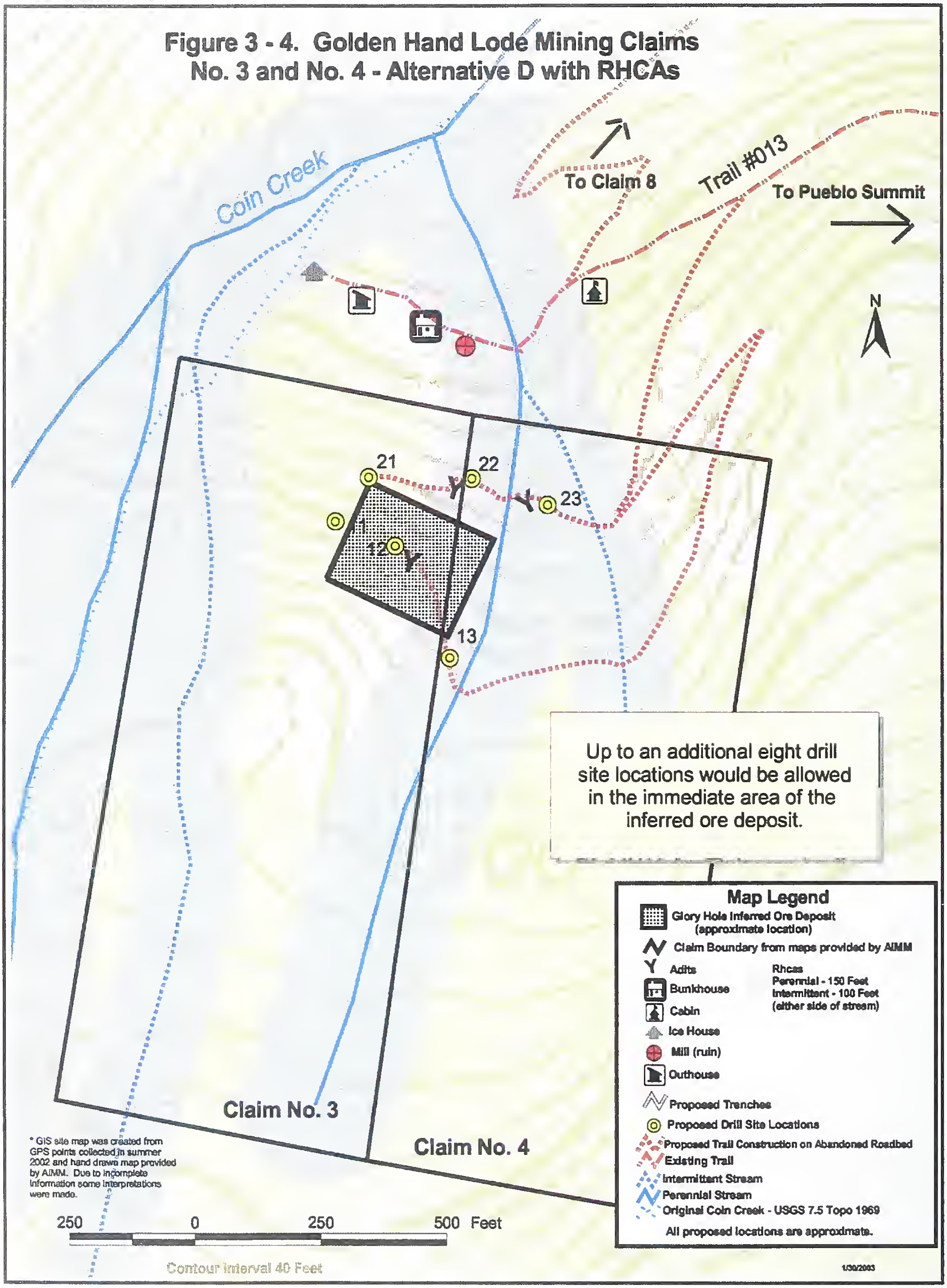


Figure 3 - 4. Golden Hand Lode Mining Claims No. 3 and No. 4 - Alternative D with RHCAs



Roads and Access Management

Scope of the Analysis

Issue #2: The effects of the proposed activities on the existing roads and access management in the analysis area.

Indicators

- Changes to roads and trails (including new road construction and construction on abandoned roadbeds)

Background

The proposed access route to the Golden Hand Nos. 3 and 4 lode mining claims includes Forest Roads (FR) 343, 371, and 373. The proposed plan would include roadwork on FR 371 and 373. Vehicles and equipment proposed for use are larger than can safely be accommodated on the existing roads. The proposed plan would include road construction and motorized vehicle use in the Frank Church River of No Return (FC-RONR) Wilderness. Approximately 4.0 miles of road would be constructed, mostly (about 3.5 miles) on abandoned roadbeds. The old roadbeds were not, in recent history, part of the PNF classified road system. Work on these roadbeds cannot be considered "road reconstruction" because reconstruction must occur on an "existing classified road" (USDA 2002). Most of this work would be classified as "light construction" (i.e., removal of vegetation, down logs, and slough).

Major Comments: Public, agency, organization, and Tribal Government comments regarding roads and access management focused on the effects of roads on water quality, fish habitat, and wilderness. Comments also focused on public access, safety, and proper upgrading and maintenance of roads. For additional information on public comments see Chapter 4.

Management Direction

The Forest Plan directs that transportation facilities be planned, developed, and operated to provide for user safety, convenience, and efficiency. Facilities should provide appropriate access to accomplish management direction and project objectives (Forest Plan, page IV-113). Forest Plan objectives require "appropriate investment and maintenance sharing from commercial users and cooperators" (p. IV-113).

For access management, appropriate access should be provided on roads, trails, and other areas that is compatible with management direction, protection objectives, considers public safety, and minimizes conflicts with other users (Forest Plan, page IV-118). Under access management, Forest personnel are required to abide by a restriction or closure in the performance of an official duty unless the District Ranger makes a decision and documents the rationale where and when this would be impractical" (p. IV-120).

The FC-RONR Wilderness Management Plan directs that reasonable access be permitted, but should have the least long lasting impact on wilderness values (USDA 1985, as amended, p. 44).

The plan also notes "mining-related roads are a major adverse impact on the wilderness resource" (p. 42).

The Code of Federal Regulations (CFR) 36 Section 228.12 states:

An operator is entitled to access in connection with operations, but no road, trail, bridge, landing area for aircraft, or the like, shall be constructed or improved, nor shall any other means of access, including but not limited to off-road vehicles, be used until the operator has received approval of an operating plan in writing from the authorized officer when required by Sec. 228.4(a). Proposals for construction, improvement or use of such access as part of a plan of operations shall include a description of the type and standard of the proposed means of access, a map showing the proposed route of access, and a description of the means of transportation to be used. Approval of the means of such access as part of a plan of operations shall specify the location of the access route, design standards, means of transportation, and other conditions reasonably necessary to protect the environment and forest surface resources, including measures to protect scenic values and to insure against erosion and water or air pollution.

As directed by the Forest Plan, as amended by PACFISH, for each existing or planned road, the Riparian Management Objectives (RMO) must be met by minimizing road locations in Riparian Habitat Conservation Areas (RHCA) and establishing and developing RMOs for each road, including preparation of road design criteria, elements, and standards that govern construction and reconstruction (USDA and USDI 1995). Sediment delivery to streams from road surfaces should be minimized through outsloping of the roadway surfaces, providing proper road drainage, minimizing disruption of natural hydrologic flow paths, and restricting sidecasting. New and existing culverts, bridges and other stream crossings should be designed to accommodate a 100-year flood, including associated bedload and debris. Crossings should be constructed and maintained to prevent diversion of streamflow out of the channel and down the road in the event of a crossing failure. Fish passage must be provided and maintained at all road crossings of existing and potential fish bearing streams (USDA and USDI 1995).

Analysis Area

The analysis area for roads and access management is the route from the Walker Millsite on the Logan Creek Road (FR 343) to Edwardsburg and up Smith Creek on FR 371 and then up FR 373 to Pueblo Summit. From the summit to the Golden Hand mining claims the analysis area includes FS Trail #013 and the associated abandoned roadbeds on the mining claims (Figure 1-2, Chapter 1). This route includes 3.5 miles on FR 343, 6.7 miles on FR 371, 3.8 miles on FR 373, and approximately 2.9 miles on Forest Trail #013.

Affected Environment

Past Actions that have Affected the Current Condition

Roads in the Edwardsburg area were generally developed for mining access beginning in the late 1800's. Originally, wagon roads and trails were developed to haul equipment to the various mine sites in the district. With the advent of the automobile in the 1920's, many wagon roads were widened and improved to accommodate motorized vehicles of the day.

The Golden Hand Mine operated primarily in the 1930s and it is likely that motorized vehicle access was built to the mine during this period to facilitate transport of equipment to the mine and removal of ore. The Golden Hand Mine ceased production in the early 1940s.

After the Idaho Primitive Area was established in 1931, preexisting travel routes were all considered trails. Motorized access was authorized through the issuance of Class D Road Use Permits. The Forest Service issued these permits to claimants at the Golden Hand for the purpose of conducting assessment and exploration/development work until January 1, 1984, when the FC-RONR Wilderness was withdrawn from mineral entry under provisions of the Wilderness Act, subject to valid existing rights.

Existing Condition

Smith Creek Road (FR 371)

The Smith Creek Road from the Warren-Profile Gap Road (FR 340) near Edwardsburg to the Big Creek Trailhead is a native surface road with an average width of 12 feet. This section of the road has drainage structures and receives scheduled maintenance. The road, which provides access to Big Creek Guard Station and campground as well as the trailhead, is suitable for most vehicles. The Big Creek Trailhead is a major portal into the western portion of the Wilderness. Stock trucks and vehicles pulling large stock trailers commonly use this section of the road.

The Smith Creek Road from the Big Creek Trailhead to the junction with the Pueblo Summit Road is maintained as a Forest Service Level 2 road. This level is suitable for high clearance vehicles. The road is native surfaced with an average width of 10 feet and no drainage structures. The alignment is fair to good with no tight corners and relatively flat to moderate grades. Relatively flat side slopes make it difficult to direct water off of the road. Road maintenance is infrequent and numerous wet spots and potholes exist. High clearance vehicles towing trailers can negotiate the road, but use is limited by the road width and condition. The road fords the North Fork of Smith Creek about a half-mile before its junction with the Pueblo Summit Road (FR 373).

Photo 7. Smith Creek Road near the ford over the North Fork of Smith Creek.

Remains of a native timber bridge were found near the ford that likely date from the period of active mining operations in the 1930s.

From the Big Creek Trailhead to the junction with the Pueblo Summit Road (FR 373), the Smith Creek Road receives light use (approximately 2 vehicles per day). The Smith Creek Road between Big Creek Trailhead and the Warren-Profile Gap Road receives moderate traffic with an estimated average daily traffic of 20 vehicles per day based on recent traffic counts on the Warren-Profile Gap Road at Profile Gap. Profile Gap is the main road into the Big Creek/Edwardsburg area, and traffic counts average between 30 to 40 vehicles per day.

Pueblo Summit Road (FR 373)

The Pueblo Summit Road (FR 373) appears to have been originally built to an approximate road width of 10 feet. The road travels 3.8 miles from the junction with the Smith Creek Road at 6,230 feet to Pueblo Summit at 8,260 feet. The road has fair to poor alignment with an average grade of 10 percent and several steep pitches in road gradient of up to 18 percent in and around switchbacks. The road has three tight switchbacks with turning radiuses of approximately 20 feet. The road is currently managed as Forest Service maintenance Level 2, suitable for high clearance vehicles. Vehicle access on the road is limited by road width, grade, and turning radius to high clearance vehicles less than 20 feet in length and less than 7 feet wide. Remains of a bridge (native timber) that likely date from the period of active mining operations in the 1930s are found at the crossing of the North Fork of Smith Creek about one mile up the road from the junction. All stream crossings are currently fords and no drainage structures (such as culverts or bridges) occur on the road.

Photo 8. Pueblo Summit Road.

Road maintenance on the road is minimal. Forest Service employees stationed at Big Creek or recreation users typically clear the road of downfall and debris in early summer. No scheduled maintenance has occurred in the past 20 years. The lack of road maintenance has resulted in fords becoming longer, mud holes deeper, and the road narrowing to an eight-foot width in many places due to sloughing and encroaching vegetation.

The Pueblo Summit Road provides access to two Wilderness trailheads. Based on trailhead registration and other recreation information, an average of 70 vehicles are estimated to travel the road each year for recreation purposes (Project Record). A mining claimant who has a small operation at the Velvet Quartz Mine also uses the road.

The typical season of road use extends from late June through October, depending on snow pack. Roads are not plowed in the winter and are effectively closed until snow melts in the early summer. During years with heavy snow packs, roads are often closed until after the Fourth of July. Roads close when snow becomes too deep to drive the roads. This usually occurs near the end of October or beginning of November.

Road use on the Pueblo Summit road can be characterized as very light. An estimate of average daily traffic is one vehicle a day. Higher use occurs on weekends, holidays, and during hunting season.

Forest Trail #013

The abandoned roadbed within the Wilderness managed as Forest Service Trail #013 extends approximately 2.9 miles from Pueblo Summit to the Golden Hand Mine site. The abandoned

roadbed occurs on moderate to steep hillsides with an average slope of 45 percent. The original roadbed appears to have been constructed to an approximate ten foot width, but has narrowed to eight feet in some areas due to the sloughing of the cut slope onto the roadbed. The surface of the road is in good shape with only very minor washing evident in some areas. The road was constructed on soils with high percentage of fractured cobbles of calc-silicate rock, which made for a stable roadbed. The road grade averages ten percent from the summit down to the mine. The road grade increases to 18 percent around the two 35 feet radius switchbacks at about the halfway point to the mine. The roadbed is out-sloped to flat with no drainage structures. The only stream crossings are near the Golden Hand Mine area.

Abandoned Roadbeds on and adjacent to Golden Hand Mining Claims Nos. 3 and 4

Near Coin Creek, an estimated total 0.2 miles of abandoned roadbed extend south (upslope) off FS Trail #013 at two sites (Figure 2-1). The longer portion of roadbed intersects and traverses Golden Hand No. 4 lode mining claim and extends into claim No. 3. Approximately, 0.4 miles of abandoned roadbed occur on the claims. These old roadbeds vary in width from 6 to 10 feet and appear to have been constructed as exploratory bulldozer work rather than roads. The old roadbed that intersects claim No. 4 includes an upper switchback constructed on a 60 percent side slope. This switchback is too narrow for a standard sized vehicle to make the turn. Alder bushes are growing in the roadbeds in wetter areas near stream crossings. Scattered small trees are also found in the roadbeds. Two parallel roadbeds cross a small perennial stream and an intermittent stream. These crossing are all fords and appear stable.

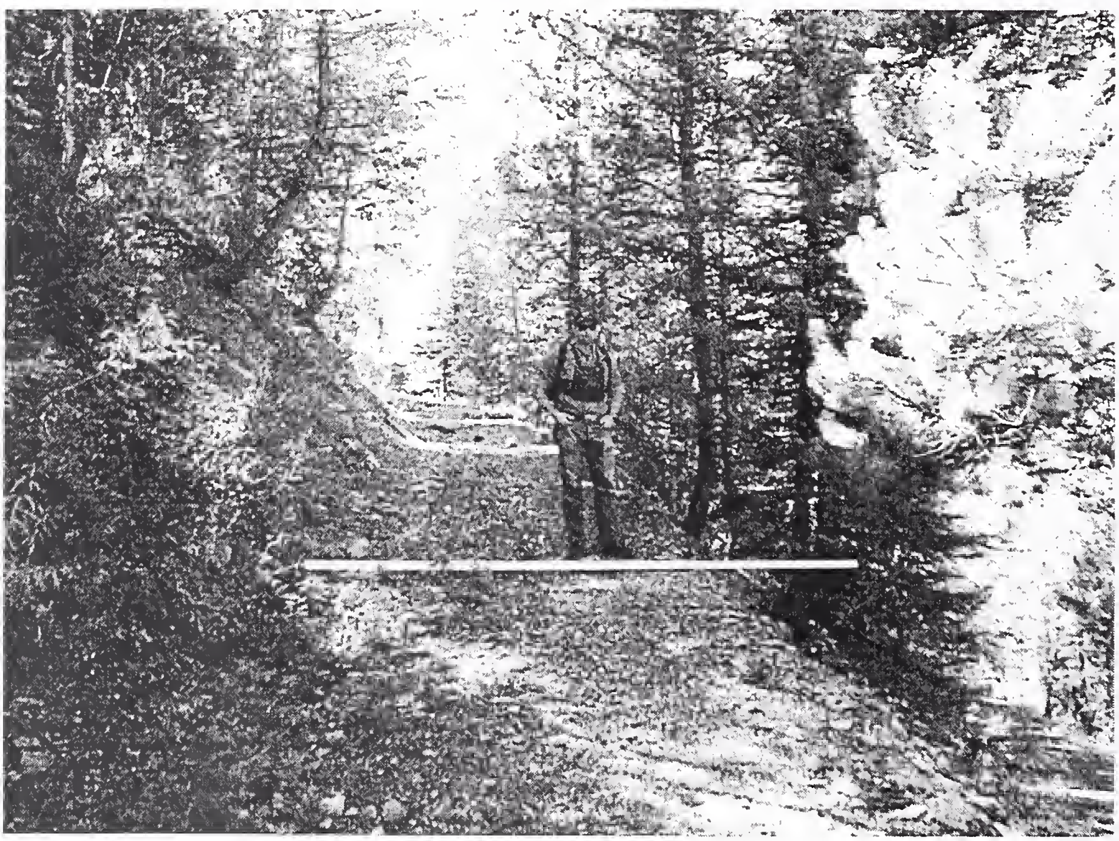


Photo 9. Old exploration roadbed south of the junction with FS Trail #013

Logan Creek Road (FR 343)

The Logan Creek Road would be used to haul up to ten dump truck loads of ore for bulk sampling from the Golden Hand mining claims to the Walker Millsite located about 3.5 miles up Logan Creek Road. The road averages 14 feet in width and receives periodic maintenance. The road is outsloped with culverts installed at the stream crossings. Grades are moderate (4-8 percent) and alignment is good. Approximately 0.3 miles of the Warren-Profile Gap Road (FR 340) would be used between the Smith Creek Road and Logan Creek Road. Both sections of Logan Creek and Warren-Profile Gap roads are adequate for the existing and proposed use. No improvements to these two roads are planned under any alternative.

Environmental Effects

Changes to Roads and Trails

Alternative A

Smith Creek Road (FR 371) and Pueblo Summit Road (FR 373)

The condition of FR 371 and 373 would remain essentially the same; the roads would continue to degrade mainly at stream crossings. The roads have not received any routine maintenance for many years. However, road maintenance activities could be scheduled for these roads to fix resource concerns. Water bars and drivable dips should be installed at key locations to direct surface runoff and its associated sediment away from streams.

Forest Trail #013 and Abandoned Roadbeds on and adjacent to the Claims

The abandoned roadbed within the Wilderness managed as FS Trail #013, would continue to be managed as a trail. No motorized equipment would be allowed to use the trail. Trail maintenance, such as removal of blow down timber, would occur only to widths to accommodate pack stock and hikers. The abandoned roadbeds on the claims would experience very limited use by recreationists.

Alternative B

Smith Creek Road (FR 371), Pueblo Summit Road (FR 373), and Forest Trail #013

Access to the claims would be on FR 371 and 373 to the Wilderness boundary at Pueblo Summit.

Within the FC-RONR Wilderness, AIMM proposes to construct approximately 4.0 miles of road. Most of the road (about 3.5 miles) would be constructed on abandoned roadbeds. Work on these roadbeds would be considered new road construction using Forest Service definitions (36 CFR 212.1, FSM 7705 – Transportation System) (USDA 2002). About 2.9 miles of this road construction would occur on Forest Service Trail #013, which is currently a foot and packstock trail. Table 3-2 displays the amount of proposed roadwork in the Wilderness.

Table 3-2. Proposed Road Construction in the FC-RONR Wilderness for the Golden Hand Mine Project under Alternative B

	Road construction-old roadbeds		New road construction	
	Off claim	On claim	Off claim	On claim
Distances	16,440 feet (3.11 miles)	2,090 feet (0.40 miles)	370 feet (0.07 miles)	2,200 feet (0.42 miles)

AIMM's proposed work on FR 371 and 373 and the abandoned roadbeds would consist of clearing loose rock, down trees, and other obstacles to maintain a safe width for equipment transport, defined by AIMM as a "minimum of 10 feet widths on the straight a ways and slightly wider on the curves".

In general, vehicle access on the Pueblo Summit Road is limited by road width, grade, and turning radius to high clearance vehicles less than 20 feet in length and less than 7 feet wide. AIMM's proposal includes a variety of vehicles and equipment including a 14 cubic yard tandem-axle truck, rubber tired drill rig and a road grader. Although AIMM states their proposed equipment can negotiate the access roads, use of some of the equipment and vehicles (such as a 14 cubic yard truck, drill rig, and road grader) would be problematic.

To analyze the ability of the road system to accommodate the proposed use, two dump trucks were measured for turning radius and dimensions (Table 3-3). One truck, a 1999 Sterling 12 cubic yard truck with tandem rear axels with dual wheels, is similar to the 14 cubic yard truck proposed for use by AIMM. The other truck was a 2001 International 6 cubic yard truck with a single rear axel with dual wheels. Both trucks were measured for dimensions and turning ability. The two trucks measured are good representatives of standard dump trucks in use today. The drivers were instructed to cut as tight of turn as possible and the tracking of the outside and inside wheels were measured. The following table displays the results.

Table 3-3. The Relative Dimensions and Turning Ratios of two Representative Dump Trucks.

Dump Truck Dimensions	1999 Sterling 12 yard^3	2001 International 6 yard^3
Front tire width (outside to outside)	8' 2"	7' 6"
Outside width (fender to fender)	8' 10"	8' 0"
Center front wheel to center rear wheel	20' 2"	12' 8"
Total Length	26' 0"	18' 10"
Maximum Height	10' 2"	9' 0"
Min. Turning radius (inside tracking)	20' 0"	16' 3"
Min. Turning radius (outside tracking)	34' 8"	27' 3"
Distance between inside and outside tracking	14' 8"	11' 0"
Turning radius at truck center	27' 4"	21' 9"

For safe vehicle use, the road width should generally be equal to the front tire width plus an additional 1 1/2 to 2 feet on both side of the tires. The minimum appropriate road width for the Sterling 12 cubic yard truck would be 11 feet 2 inches and for the International 6 cubic yard truck would be 10 feet 6 inches. The size of switchback that could be negotiated by the Sterling 12 cubic yard truck would have a centerline radius of 28 feet with a road width of 18 feet 8 inches to allow for 2 feet on both sides of the wheel tracking. The International 6 cubic yard truck could negotiate a 22 feet radius switchback with a road width of 15 feet.

The three switchbacks measured on the Pueblo Summit Road had a centerline radius of 20 feet with a road width of 14 feet. It is likely the single axle 6 cubic yard dump truck would be able to make the turns with some backing and pulling forward. The dual axel 12 cubic yard dump truck would not be able to negotiate the switchbacks. The road would need to be widened from 14 feet to 18 feet 8 inches on the outside of the curve to provide a greater radius and adequate width.

The road to the Golden Hand Mine and the Pueblo Summit Road were probably built in the 1920s to accommodate the trucks of the time, which were typically smaller and narrower than trucks in use today. The dimensions of two trucks dating from the 1940s were measured for comparison with modern trucks (Table 3-4).

Table 3-4. The Relative Dimensions and Turning Ratios of two Representative Trucks.

Truck Type	1941 Ford w/ American LaFrance Fire Engine Body (single axle w/dual tires)	1947 Chevy Flatbed (single axle w/ dual tires)
Front tire width (outside to outside)	5' 9"	5' 10"
Rear tire width (outside to outside)	7' 0"	7' 4"
Center front wheel to Center rear wheel	13' 2"	13' 4"
Total Length	20' 6"	21' 6"

Using a front tire width (outside to outside) of 6 feet and adding 2 feet width on both sides results in a width of ten feet, which is what the road appears to have been constructed and maintained to during the period of active operations in the 1930s.

The Forest Service Road Preconstruction Handbook (FSH 7709.56) states that the minimum road traveled-way width for a single lane road for recreational, administrative and service vehicles 6.5 to 8 feet wide is 10 feet for a design speed of less than 20 miles per hour. The handbook further states that the minimum road traveled-way width for a single lane road with commercial hauling and commercial passenger vehicles including buses 8 feet wide or greater is 12 feet for a design speed of less than 20 miles per hour.

Based on the information presented above, it is likely the Pueblo Summit Road (FR 373) and FS Trail #013 would actually be widened to 12 feet under AIMM's proposed plan. It is anticipated the widening would occur on the cut slope side and the excavated material would be incorporated into the roadbed. If excavated material was sidecast it could have unacceptable resource impacts such as increasing sediment delivery to sideslopes and streams. Trees would need to be removed in some areas, resulting is removal of up to an estimated 170 trees. Road widening would not change the current Forest Service Level 2 road maintenance level.

AIMM proposes to take any construction material needed for roadwork from the existing roadbed and bank. This use and any widening of the road into cut slopes could cause increased sediment movement and instability of cut and fill slopes.

The proposed plan would increase vehicles use on FR 371 by 250 round trips from the current estimated 70 round trips per year (Project Record). The increased road use would increase the risk of vehicle accidents and additional road impacts such as rutting and erosion, particularly at stream crossings. Road widening to accommodate AIMM's larger vehicles and equipment would allow other wider vehicles such as standard sized dump trucks to negotiate the road, which would make it easier to maintain the road with standard equipment, but could also have negative effects due to increased road use by larger vehicles.

The proposed plan of operation would use the existing fords of the North Fork of Smith Creek. The widening of the road along with the increased vehicle traffic at these sites would increase the disturbance at these stream crossings, and add direct sediment input into the streams.

Roads on the Mining Claims

Roads on Abandoned Roadbeds

The old roadbed that leave FS Trail #013 to access mining claims No. 4 appears to have been constructed as exploratory bulldozer work rather than a road. The old roadbed includes an upper switchback constructed on a 60 percent side slope with no radius for a rubber-tired vehicle to make the turn. Considerable excavation work would be required on this switchback to allow for use by a rubber tired drill rig or a dump truck unless the vehicle was backed up the road between the switchbacks.

The abandoned roadbeds cross-streams at the mine site, but these fords are relatively stable after years of inactivity at the mine. Under Alternative B, it is likely the fords would need to be widened and leveled so vehicles could cross. The increased disturbance at the fords would increase sedimentation input into the streams.

New Road Construction and Trenching

The areas proposed for new road construction, trenching, and drilling activities beyond the end of the old roadbeds are either rocky or wet. The uppermost (southern) proposed road would cross flatter ground (slopes of 15 to 40 percent) and two small streams (Figure 2-1). The lower proposed roads are on steep rocky ground and would require full bench construction in many areas.

A major concern with the activities proposed on the Golden Hand Nos. 3 and 4 lode-mining claims is the construction of roads and exploratory trenches parallel to the fall line on steep grades. Roads constructed directly up and down the fall line on steep slopes tend to become trenches. Water runs down the road and becomes nearly impossible to drain off of the roadbed at the lowest point. The upper proposed road and trench locations A and D appear to have this potential based on the map of the proposed locations (Figure 2-1). This especially becomes a problem given the location of the mine in a cirque basin where water tends to collect. Roads constructed directly up and down the fall line are very difficult to reclaim and often become gullies or intermittent stream courses, due to severe washing. Water bars are ineffective since there is nowhere for the water to drain.

The roads proposed on the steep ground just beyond the Glory Hole adit would likely be stable since the ground is primarily bedrock, and away from a stream. Construction of the road in the steep bedrock would be expensive, but should not be a concern for sedimentation or stability problems.

Currently, the proposed stream crossing on the highest (southernmost) new road would be a ford. A ford would require fill placement in the stream causing sedimentation.. Some type of structure should be installed in lieu of a ford. The ground adjacent to the stream is relatively flat, but the stream is incised, and a ford would cause more potential disturbance than putting in a temporary structure, due to the grades in and out of the stream.

Where new roads are proposed on flatter sections of ground, it is possible that driving over the ground with the drill rigs would be preferable than excavation of a new road. These opportunities should be considered and reviewed by a Forest Service engineer.

Road Work Mitigation Measures

The extent of the roadwork in Alternative B is based on AIMM's proposed plan of operations. It is possible that AIMM's proposed roadwork would result in 12-foot wide roadbeds in order to accommodate their proposed vehicles. There is no provision in the plan for erosion control (other than seeding during seasonal reclamation) on newly disturbed surfaces (e.g. cutslopes and fillslopes).

AIMM proposes to construct water bars, repair existing drain gullies and armor some stream crossings with rocks "if necessary for resource protection." While these activities are generally considered improvements, if not implemented correctly (including the use of BMPs), the activities could degrade soil and water conditions. Alternative B does not specifically include the use of BMPs or other mitigation measures for the proposed roadwork.

Alternative C

Alternative C allows for motor vehicle access to the Golden Hand No's. 3 and 4 mining claims with the following modifications:

- Road construction in the Wilderness would be reduced to 3.4 miles.
- Vehicles would be restricted to a tire tread width of less than seven feet and equipment would be restricted to a track width of less than eight feet.
- Roadbeds would not be widened except for at switchbacks; slough and vegetation would be removed.
- Additional road improvements would include installation of culverts, dips, waterbars, spot graveling, construction of a bridge, and installation of geo-grid ford (see Tables 2-2 and 2-3 in Chapter 2). This work would occur prior to implementation of mining and road building activities in the Wilderness.
- Best Management Practices (BMPs) would be incorporated to minimize sediment production and other effects to soil and water resources (Appendix D).

Smith Creek Road (FR 371)

The improvements to Smith Creek Road from the Big Creek Trailhead to the Pueblo Summit Road would consist of filling pot holes with gravel, installing gravel lined cross drains with lead off ditches to direct water off the road and into vegetative buffers, and installing a geo-grid ford on the crossing of the North Fork of Smith Creek (Tables 2-2 and 2-3 in Chapter 2).

A geo-grid is a plastic honeycombed structure that is filled with gravel. The geo-grid keeps the gravel in place while the entire structure prevents the ford from lengthening during vehicle use. A geo-grid ford was selected for this crossing in lieu of a bridge because bridge construction was determined to be impractical and very costly. The stream gradient and the entry and exit road grades to the stream at the site are approximately four percent. Bridge construction at this site would require placement of a large amount of fill in the wetland in order for the bridge to have adequate clearance above the stream. The geo-grid ford would allow passage of stream bedload and debris during high flows. The existing streambed material is mostly smaller rocks and cobble that would fit into the geo-web. The roughness of the ford would approximate that of the existing stream bottom and would not tend to accelerate stream velocities that could cause down cutting and bank stability problems downstream.

The planned road improvements would protect the existing road from further deterioration due to projected increases in traffic and correct deferred maintenance items such as filling potholes. The improvements would also reduce the road's impacts to streams by reducing sedimentation and stabilizing the stream crossing on the North Fork of Smith Creek.

Pueblo Summit Road (FR 373)

The improvements to the Pueblo Summit Road would include installation of culverts and drivable dips and water bars, spot graveling, removing slough, and widening the turning radius from 20 feet to 25 feet on three switchbacks. A 20 feet span log stringer bridge would be constructed to replace the ford on the North Fork of Smith Creek approximately one mile up from the Smith Creek Road junction.

The width of the road would remain 10 feet with some wider spots on the tight curves. This road width would limit the road use to vehicles and equipment with a wheelbase less than 7 feet. Gravel and ore would be hauled with a narrow wheel based dump truck. Standard size road graders would probably not be able to negotiate the road due to the tight curves on the switchbacks. Reshaping and installation of waterbars and dips would likely be done with a small bulldozer or backhoe.

The gravel source identified for the road improvements is the waste rock pile at the Werdenhoff Mine site. A short section of road off of the Pueblo Summit Road would be used to access the site. The gravel at the site is fractured, well-sorted gravel with a sand fraction. Clay fines are minimal. The gravel would likely be spread with a small bulldozer or backhoe rather than a road grader. Compaction of the gravel would likely be by equipment or a towed grid roller.

Dips and driveable water bars would be installed in the roadbed to prevent surface_washing and sediment delivery to streams at approximately every tenth of a mile. Care should be taken that the dips and water-bars drain into a vegetative buffer to prevent sediment from reaching a stream. Some of the smaller streams and wet areas would have culverts installed with ditch lines leading to the culverts in wet areas to protect the road surface. The ditch lines would be graveled as well as the wet spots on the road. Culvert installation would require bedding material that seals the culvert from water running around the pipes. Soil material excavated on site is anticipated to be suitable for bedding material. Culverts would be installed using Best Management Practices, such as temporary stream diversions, silt fences, and other erosion mitigation measures (see Appendix D).

A native log stringer bridge is planned for the crossing of the North Fork of Smith Creek approximately one mile up from the Smith Creek Road junction. Standing Douglas fir snags for constructing the bridge are available adjacent to the road approximately ½ mile below the bridge site. The abutments and stringers would be made of Douglas fir logs, and the decking would be rough sawn planking of Douglas-fir or western larch. It is anticipated that the native timber bridge would have a life span of 10 to 20 years depending on the rate of decay of the timbers.

A bridge was selected at this site for several reasons. The stream gradient in this area is about seven percent and the substrate is boulders and cobble. A constructed ford would likely accelerate the flow, causing bank scouring and undercutting below the ford. Coarse cobbles would likely move down stream during high flows and could deposit in the ford. The grades into and out of the existing ford are 8 to 12 percent and the stream channel is well confined and is somewhat incised. The existing ford has become lengthen and has captured a small stream adjacent to the main stream. Vehicles currently drive over a large flush cut spruce stump in the

ford. The bridge would span the North Fork of Smith Creek and the small feeder stream would be put in a culvert and put back in its original channel. Abutments would need to be built on both sides of the stream using log cribs and fill material from the Werdenhoff gravel source.

The planned road improvements would protect the existing road from further deterioration due to projected increases in traffic and correct deferred maintenance items such as stabilizing wet spots. The improvements would also reduce the road's impacts to streams by reducing sedimentation and improving stream crossings.

Forest Trail #013

The 2.7 miles of road within the Wilderness being managed as FS Trail #013, would be used as a road for moving equipment and personnel to and from the Golden Hand Mine site. The road would be re-opened and slough and down trees removed. The road bed width would be restored to the original width of ten feet. This section of road would only be used for mining purposes. The public and the Forest Service would not be allowed to use this section of road within the Wilderness. Vehicles with a wheelbase greater than 7 feet would not be allowed to use the road. The gate at Pueblo Summit would be improved and boulder barriers constructed to prevent unauthorized use.

Roads on the Mining Claims

Roads on Abandoned Roadbeds

Mitigation measures contained in Alternative C would reduce the need for substantial construction and excavation work and would minimize sediment production. These measures include the requirement for AIMM to use rubber-tired vehicles with tire widths of less than 7 feet and track mounted equipment with track widths of less than 8 feet. Use of BMPs and other mitigations (Appendix D) would protect the roadbed and streams.

The abandoned roadbeds cross streams at the mine site, but these fords are relatively stable after years of inactivity at the mine. Under Alternative C, these fords would not need to be widened. Use of these fords would be monitored during the first year or operations. Channel substrate movement would be evaluated. If determined necessary by a Forest Service biologist or hydrologist, the bottom end of the fords would be rip-rapped with coarse rock to prevent unacceptable down-cutting of the fords by the stream during spring snow melt. In addition to rip rap, any shrubs, trees, or bush cleared off of the roads would be used as a slash filter windrow below the fills on both sides of the fords to capture sediment (see additional mitigation descriptions in Appendix D).

New Road Construction

As a mitigation measure, road construction would be limited to specific areas: no roads would be constructed directly up or down the fall line, in RHCAs, or on slopes greater than 35 percent with saturated soils. All proposed roads would be flagged and reviewed and approved by a Forest Service engineer prior to construction. Road width on new road construction would be limited to 10 feet width.

Road Work Mitigation Measures

Under Alternative C, the Forest Service would approve new road routes and design and ground disturbance would be minimized when constructing roads. All proposed roadwork and erosion control measures would comply with Forest Service Soil and Water Conservation Practices (FSH 2509.22), and State of Idaho mining BMPs (Appendix D), and practices listed in the Biological Assessment for ongoing actions in the Middle Fork Salmon River watersheds (Wagoner & Burns 2001). Forest Service approved erosion control measures would be implemented in a timely manner. A detailed erosion control plan would be included in the plan of operations.

Erosion control measures would vary depending on the road location and long-term management goals. In general, all road segments within Riparian Habitat Conservation Areas (RHCAs) would receive the highest mitigation. Non-RHCA segments of classified roads would receive the next highest mitigation level because improvements would be permanent. The non-RHCA segments within the wilderness would ultimately be completely recontoured during final reclamation, so they require only temporary erosion control measures during project implementation. The Soil and Water Conservation Practice (SWCP) numbers to which a specific measure pertains are shown in parenthesis. See Appendix D for a list of SWCPs and relevant Mining BMPs.

The following measures would be used for roadwork on all roads (outside and inside Wilderness):

- No widening of the existing roads or abandoned roadbeds and no sidecasting during their maintenance/improvement (15.02, 15.10) except for widening of switchbacks that would require some sidecasting. Seed sidecast material with a Forest Service-approved native seed mix and mulch with certified weed-free straw applied in a uniform layer at a rate of two tons per acre (15.03, 15.06, 15.09). Use any locally available slash on top of the straw to anchor it.

- Drift cutslope slough deposits across the running surface (15.07) and blade the running surface to an outslope where possible to do so without widening the road or sidecasting material (15.02, 15.07). End haul any excess material that cannot be incorporated into the road surface to a Forest Service-approved spoil site (15.10).

- Construct driveable dips on road segments with relatively gentle grades (less than approximately 8 percent) and waterbars on road segments with steeper grades (15.07) at intervals appropriate to the grade (as flagged by a Forest Service representative). Maintain these structures as determined necessary by a Forest Service representative (15.21).

In addition to the previous measures, the following measures would be used for roadwork in RHCAs:

- Use silt fence as a temporary sediment control measure and install according to the manufacturer's directions at locations identified and flagged by the Forest Service (15.06, 15.10). Maintain silt fence by removing stored sediment to the road surface and remove fence at the end of the project or as soon as vegetative erosion control measures have effectively reduced sediment production.

- Armor approaches to existing stream fords with aggregate (15.12, 15.15, 15.19) as determined necessary by a Forest Service representative. Where the immediate approach

to a ford is a short gentle downgrade on an otherwise uphill grade, blade material from the road surface into a broad driveable berm adjacent to the ford to provide sufficient freeboard to prevent the stream from overflowing down the road during peak flows. Construct the berms according to Forest Service direction for location, direction, compaction, and armoring.

- Obtain aggregate for fords on the Smith Creek and Pueblo Summit roads from a Forest Service-approved area at the waste dump at the Werdenhoff mine (15.17). Obtain aggregate for fords on Claim #4 from the top of the waste rock dump at the lower adit.

- In the Wilderness, clear alder thickets on the abandoned roadbeds by cutting rather than uprooting. Do not blade or excavate on roadbeds within 25 feet of the bank-full stream level (15.13).

In addition to the measures to be used on all roads, the following measures would be used for new road construction that occurs off of old roadbeds in the Wilderness:

- Construct new road segments to a width of 10 feet or less (15.02). On sections that require full-bench construction, end-haul the available fine surface material to a Forest Service-approved spoil site (15.10) and store for road reclamation.

Alternative D

The access requirements and road maintenance actions on FR 371 and 373 would be the same for Alternative D as described in Alternative C. Under Alternative D, no roadwork or mechanized access would occur in the Wilderness; therefore the roadwork mitigation measure described above for Alternative C would apply only to FR 371 and 373.

Cumulative Effects

The primary ongoing and future actions that apply to roads and access management in the cumulative effects analysis area are road maintenance and construction, revision of the Payette National Forest Travel Management Plan (Appendix A), and AIMM's proposed exploration work on the Golden Hand lode mining claims Nos. 1 and 2. The effects to road condition (such as the condition of the roadbed or stability of cut and fill slopes) and access management (such as safety and traffic volumes) predicted under the alternatives in the DEIS would be potentially cumulative to the aforementioned actions. The effects under Alternative B would likely have a negative cumulative effect when combined with the other actions in the analysis area. Positive effects from road improvements under Alternatives C and D would likely have a positive cumulative effect on roads and access management in the analysis area.

Irreversible and Irretrievable Commitments

Roads are irretrievable commitments of the landscape until these areas recover naturally or are restored to a natural state and function. Irreversible commitments would occur if the roads were never obliterated from the landscape.

Forest Plan Consistency

Alternatives C and D would be consistent with Forest Plan direction that appropriate access should be provided on roads, trails, and other areas that is compatible with management direction, protection objectives, considers public safety, and minimizes conflicts with other users (Forest Plan, page IV-118). Alternative D best meets direction in the FC-RONR Wilderness Management Plan that reasonable access (to valid mining claims) be permitted, but should have the least long lasting impact on wilderness values (USDA 1985, as amended, p. 44) because, as the plan notes: "mining-related roads are a major adverse impact on the wilderness resource" (p. 42). The action alternatives to varying degrees follow Forest Plan direction for "appropriate investment and maintenance sharing from commercial users and cooperators" (p. IV-113).

Specialist Report

This DEIS hereby incorporates by reference the Roads and Access Management Specialist Report in the Project Record (40 CFR 1502.21). The Roads and Access Management Specialist Report is located in Section 5(5) of the Project Record and contains the detailed data, methodologies, analyses, conclusions, maps, references, and technical documentation that the PNF Engineer relied upon to reach the conclusions in this DEIS.

Wilderness Resource

Scope of the Analysis

Issue #3: The effects of the proposed activities within the Frank Church-River of No Return (FC-RONR) Wilderness on the wilderness character.

Indicators

- Effects on natural integrity
- Effects on untrammeled condition

Background

The 1964 Wilderness Act (also referred to as the Act) defines Wilderness as:

> A Wilderness in contrast with those areas where man and his own works dominate the landscape, is hereby recognized as an area where the earth and community of life are untrammeled by man, where man himself is a visitor who does not remain. An area of Wilderness is further defined to mean…an area of undeveloped Federal land retaining its primeval character and influence, without permanent improvements or human habitation, which is protected and managed so as to preserve its natural conditions…(Sec 2[b]).

The Wilderness Act further states: "Except as otherwise provided in this Act, each agency administering any area designated as wilderness shall be responsible for preserving the wilderness character of the area..." (Sec 4[b]).

Wilderness is a resource that consists of many interacting and contributing biophysical and social elements that include: wildlife, fish, recreation, soils, water, vegetation, wildness, scenery, and cultural resources. As such, wilderness can be viewed as a "composite" resource, and management must focus on the whole rather than the component parts (Hendee et al. 1990). In analyzing the effects on the wilderness resource, all of these interacting elements need to be taken into consideration.

Wilderness character can be represented by natural integrity and untrammeled conditions. Natural integrity has been defined as "the extent to which human influences alter natural processes by comparing the condition of the area to its probable condition without human impacts" (USDA 2001, pp. 4-255). Untrammeled refers to conditions where human influence does not impede the free play of natural forces or interfere with natural processes (FSM 2300, p. 9). Even though natural integrity and untrammeled conditions are similar, they differ in that untrammeled means "…freedom from human control rather than lack of human influences" (Cole 2000). Thus, an area could be low in natural integrity because of previous human influences, but high in untrammeled conditions if natural processes are being allowed to operate freely.

Wilderness character can be realized on-site when visiting a wilderness area or off-site by simply knowing that the National Wilderness Preservation System exists to provide for preservation of natural and untrammeled conditions. As shown in the survey results discussed below, there is

satisfaction in realizing that areas have been designated "... to assure that an increasing population, accompanied by expanding settlement and growing mechanization, does not occupy and modify all areas within the United States and its possessions, leaving no lands designated for preservation and protection in their natural condition... (The Wilderness Act, 1964, Sec2 [a]). A 1995 national survey rated the importance of 13 values of wilderness (Cordell et al. 1998). Results indicated that respondents held off-site values including the knowledge that water quality, wildlife habitat, and air quality were being protected for future generations, as the most important. On-site values such as recreational opportunities were found to be less important. Haas and others (1986) also conducted a study on the values people place on wilderness, and found that people place a lot of importance on biophysical resources, and knowing they have the option now and in the future to visit an area that they perceive as being "unimpaired for future use and enjoyment as wilderness".

Wilderness character represented by natural integrity, untrammeled conditions, and public perceptions of wilderness can be measured by factors that indicate human control or influence such as the presence of human habitation, physical disturbance of the landscape, and motorized and mechanized use and access. Additional discussions of the ecological impacts of the proposed activities can be found in the Fisheries, Wildlife, and Soil and Water Resources sections.

Major Comments: Comments received from the public, agencies, organizations, and Tribal Governments regarding wilderness character focused on concerns with motorized and mechanized use in the Wilderness, the environmental impacts to the wilderness, and the precedent associated with this project. Additional information is provided in Chapter 4.

Issue #4: The effects of the proposed activities within the FC-RONR Wilderness on visitors' wilderness experience.

Indicators

- Effects to solitude and sense of remoteness
- Effects to primitive recreation

Background

The Wilderness experience that recreationists can expect is defined in the Wilderness Act as:

> (1) generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable; (2) has outstanding opportunities for solitude or a primitive and unconfined type of recreation... (Section 2[c])

Wilderness experience can be expressed in terms of solitude and sense of remoteness, and opportunities for primitive recreation. Activities that can affect a wilderness experience for the recreationist include encounters with motorized vehicles, amount and type of physical disturbance, noise, and signs of mechanization and development. The duration of these impacts is also an important factor to consider when analyzing the effects on the wilderness experience because of the amount of time recreation use may be displaced from Trail #013.

Major Comments: Comments received from the public, agencies, organizations, and Tribal Governments focused on concerns with the proposed activities compromising the peace and

serenity of a wilderness experience, and the incompatibility of the proposed activities with wilderness values. See Chapter 4 for additional information on public comments.

Management Direction

The Wilderness Act (1964), the Central Idaho Wilderness Act (1980), Forest Service Manual (FSM) and Forest Service Handbook (FSH), and the FC-RONR Wilderness Management Plan (USDA 1985, as amended) are the primary sources of Forest Service management direction for this project area. The Payette National Forest Land and Resource Management Plan (USDA 1988, as amended) incorporates the direction of the FC-RONR Wilderness Management Plan by reference.

The Wilderness Act of 1964 was enacted "In order to ensure that an increasing population, accompanied by expanding settlement and growing mechanization, does not occupy and modify all areas with in the United States and its possessions, leaving no lands designated for preservation and protection in their natural condition..."(Section 2 [a]). The Act defines wilderness as an area "untrammeled by man" that has "outstanding opportunities for solitude or a primitive and unconfined type of recreation" and directs agencies to preserve wilderness character and natural conditions. The Act restricts (with some exceptions) activities in the wilderness such as construction of roads, motor vehicles, motorized equipment, structures, installations, aircraft landings and mechanical transport (Section 4 [c]).

The Act states:

> ...each agency administering any area designated as wilderness shall be responsible for preserving the wilderness character of the area and shall so administer such area for such other purposes for which it may have been established as also to preserve its wilderness character. Except as otherwise provided in this Act, wilderness areas shall be devoted to the public purposes of recreational, scenic, scientific, educational, conservation, and historical use (Section 4 [b]).

In addition, the Act provides for mining claims determined to be valid prior to January 1, 1984 to be used only for mining and processing and uses "reasonably incident thereto" (Section 4 [d][3]). Section 5 (b) states that valid mining claims within designated wilderness shall

> ...by reasonable regulations consistent with the preservation of the area as wilderness, permit ingress and egress to such surrounded areas by means which have been or are being customarily enjoyed with respect to other such areas similarly situated.

The FSM (Chapter 2320.3 p. 8) provides the following direction: "Where there are alternatives among management decisions, wilderness values shall dominate over all other considerations except where limited by the Wilderness Act, subsequent legislation, or regulations." The FSM also states "in wildernesses where the establishing legislation permits resource uses and activities that are nonconforming exceptions to the definition of wilderness as described in the Wilderness Act, manage these nonconforming uses and activities in such a manner as to minimize their effect on the wilderness resource" (Chapter 2320.3 p. 8); and, "Preserve the wilderness environment while allowing activities for the purpose of gathering information about mineral resources", and ensures that "mineral exploration and development operations preserve the wilderness resource to the extent possible" (FSM 2323.72 p.10).

The United States Congress designated the FC-RONR Wilderness in July 1980 with the passage of the Central Idaho Wilderness Act, which mandated the development of a comprehensive wilderness management plan. The FC-RONR Wilderness Management Plan (1985, as amended), also referred to as the Wilderness Plan, states as a management goal that the FC-RONR Wilderness "...be managed for a broad range of land uses and recreation opportunities in a manner that will leave them unimpaired for future use and enjoyment of wilderness" (FC-RONR Wilderness Management Plan, p. II-15).

The overall objective under Minerals and Energy in the Wilderness Plan is to: "Administer mining activities to assure the least possible impact on the wilderness resource without unreasonable impairment on property rights, and provide for the orderly development of mineral resources" (FC-RONRW Management Plan, p. III-41). Additional direction in the minerals section includes: "Reasonable access cannot be denied, but should be located to have the least long lasting impact on Wilderness values..." and:

- Harmonize operations with scenic values to the extent possible.
- Utilize design, location, and screening to blend structure and improvements (including roads) with the landscape.
- Minimize lasting evidence of timber removal; avoid making obviously artificial openings, and cut stumps as close to the ground as practicable (FC-RONR Wilderness Management Plan, p. III-44).

Additional direction under the Wilderness Plan includes: "Whenever possible, inform wilderness visitors of mining operations that may impact their wilderness experience, in order to provide for safety and reduce the possibility of conflicts" (p. 43).

Analysis Area

The analysis area for direct, indirect, and cumulative effects to wilderness character includes the entire FC-RONR Wilderness (Figure 3-5).

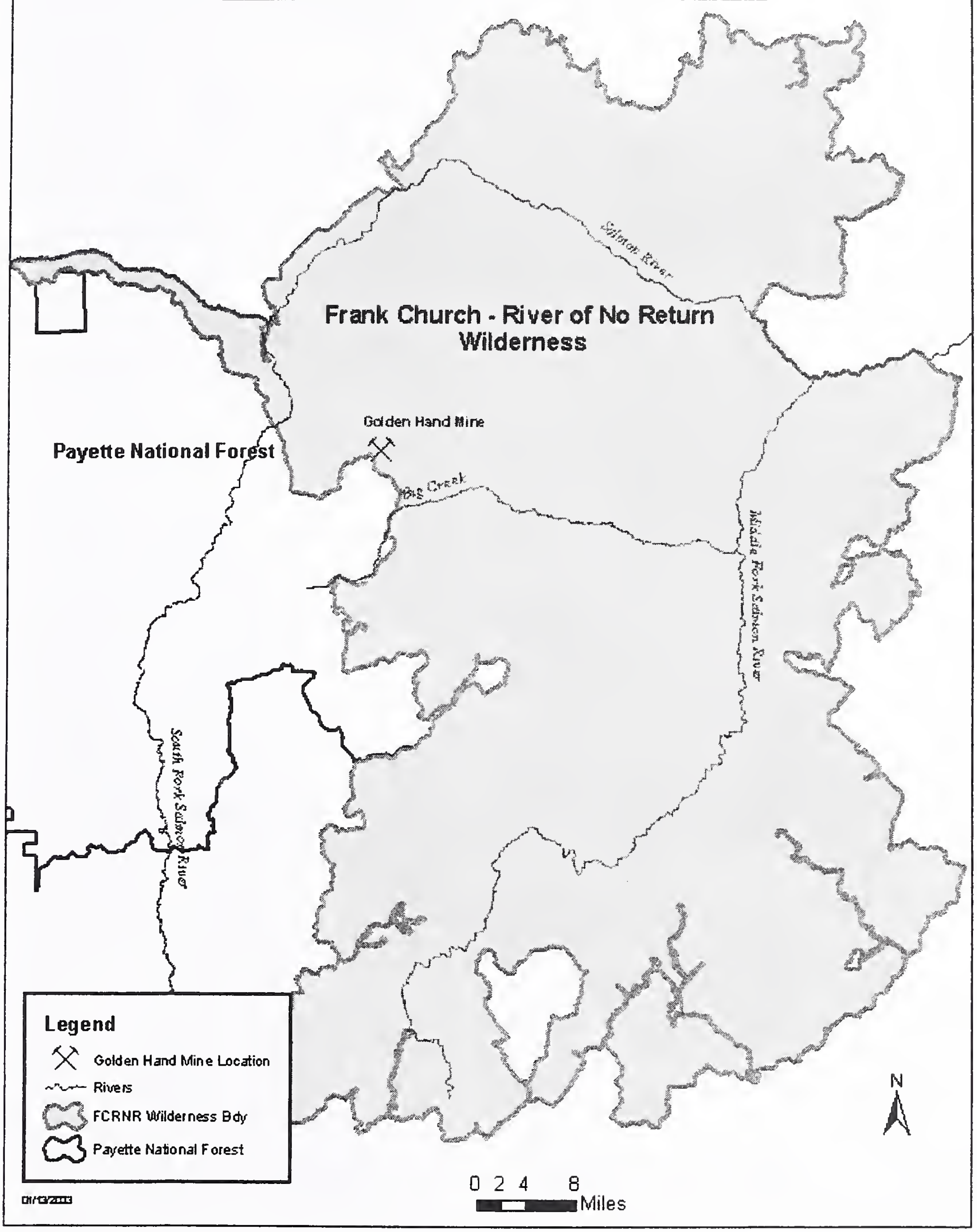
For wilderness experience, indirect and cumulative effects were analyzed for the entire FC-RONR Wilderness (see Figure 3-5). For direct effects, the analysis area includes only the Beaver Creek and Hand Creek drainages, and the surrounding ridgetops that encompass the project area (Figure 3-6).

Affected Environment

Past Actions that have affected the Current Condition

The Golden Hand No. 3 and No. 4 lode mining claims (hereafter referred to as the claims or Golden Hand Mine site) occur in an area that has been altered by past mineral exploration and development activities dating from the late 1800s to 1941 (Cater et al. 1973). After production and development ended in 1941, the road from Pueblo Summit to the Golden Hand mine was abandoned and managed under Idaho Primitive Area guidelines. The Idaho Primitive Area was designated in 1931 to "conserve primitive conditions of environment, habitation, subsistence and transportation for the enjoyment of those who cherish the early traditions..." (Management Plan

Figure 3 - 5. Wilderness Character Map
Golden Hand Mine Project



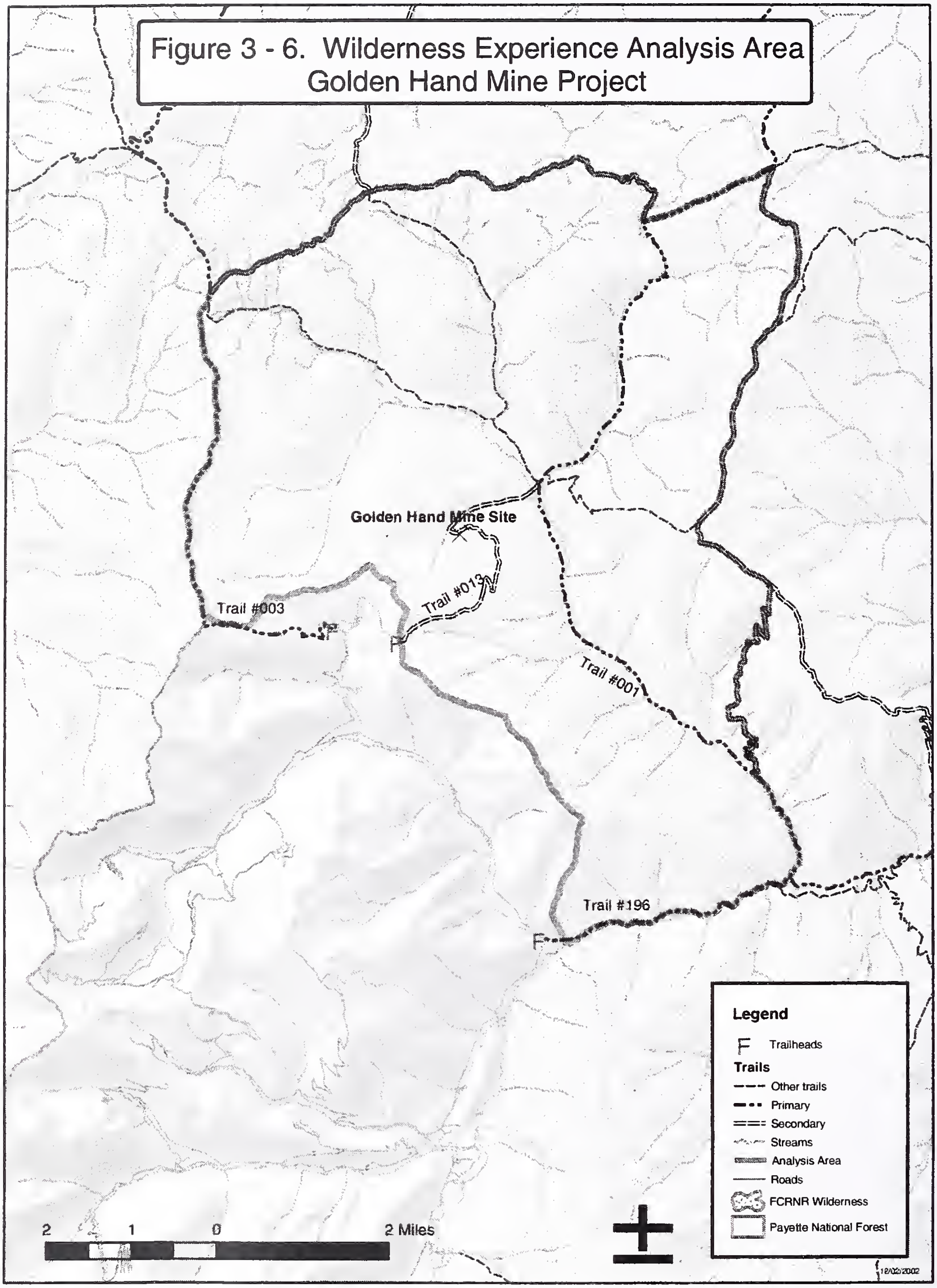


Figure 3 - 6. Wilderness Experience Analysis Area
Golden Hand Mine Project
Golden Hand Mine Site
Trail #003
Trail #013
Trail #001
Trail #196
Legend
Trailheads
Trails
Other trails
Primary
Secondary
Streams
Analysis Area
Roads
FCRNR Wilderness
Payette National Forest
2
1
0
2 Miles

for the Idaho Primitive Area, 1978, Appendix – Exhibit A). A 1959 map of the Idaho Primitive Area shows the road terminating at Pueblo Summit and a trail entering the Idaho Primitive Area. However, unauthorized motorized use of this trail did occur. In the late 1970s, the Forest Service physically blocked these old mining roads to prevent these unauthorized intrusions (Big Creek District Visitor Use Data Summary, 1976-1978 and Pope, pers. comm. 2002). This trail (Trail #013) continues to serve non-motorized uses.

Existing Condition

In 1980, the United States Congress designated the River of No Return Wilderness (now known as the Frank Church-River of No Return Wilderness [FC-RONR Wilderness]) with the passage of the Central Idaho Wilderness Act. This Wilderness included 2,361,767 acres of federal land that had largely been managed as a primitive area since the 1930s (Idaho Primitive Area, Salmon River Breaks Primitive Area, and adjacent Roadless Area Review and Evaluation [Rare] II units). The FC-RONR Wilderness represents the largest contiguous designated wilderness in the lower 48 states. Four National Forests currently have administrative responsibilities for the FC-RONR Wilderness (Bitterroot, Salmon-Challis, Nez Perce, and Payette). The PNF administers approximately 770,000 acres of the Wilderness.

The Golden Hand claims are located in the FC-RONR Wilderness and are accessed via Forest Roads (FR) 371 and 373 to Pueblo Summit, and then 2.7 miles into the Wilderness on Trail #013 (see Figure 1-2, Chapter 1). The distance from the claims to the Big Creek Forest Service Station is 12.3 road miles. The city of McCall is located approximately 87 road miles from the claims. The area of the claims is characterized by high open ridge tops with white bark pine and lodgepole pine forests, and low elevation creek bottoms. There are 28.3 miles of primary trails and 16.3 secondary trails in the wilderness experience analysis area. Primary trials are high priority trails that generally receive more use. A secondary trail is moderate priority for maintenance based on use and resource conditions.

Pueblo Summit is a trailhead portal to the FC-RONR Wilderness used by backpackers, hunters, packers, and day hikers. This trailhead is marked with a Wilderness boundary sign, a gate to block motorized intrusions into the Wilderness and a trailhead registration box. At the trailhead there is dispersed camping that is generally associated with hunting in the fall. Trailhead registration information indicates that the trail receives relatively low use. Based on an estimated registration rate of 30 percent, an average number of 18 private groups per year entered the FC-RONR Wilderness via the Pueblo Summit Trailhead over the past 20 years (1982-2001), resulting in an average of 673 Recreation Visitor Days (RVD) per year (Big Creek and Krassel District Visitor Use Data Summary, 1974-2001 and Wilderness & Recreation Specialist Report). A RVD is defined as any twelve hours of recreation use. Additional information on visitor use data is provided in the Wilderness Specialist Report in the Project Record.

The Pueblo Summit Trailhead provides access to the FC-RONR Wilderness along Trail #013. The first 2.7 miles of the trail is an old roadbed that was used to access the Golden Hand Mine area. It is unknown precisely when this road was constructed and if it was built for vehicle or wagon traffic (Kingsbury, pers. comm. 2002). This road was abandoned and has been managed and maintained for use as a non-motorized trail; no active rehabilitation or re-contouring of the old roadbed has taken place (Pope, pers. comm. 2002). Since the end of the mining operations and abandonment of the road, this route has been maintained to wilderness trail standards that includes an eighteen inch tread and a clearing width of three to four feet from trail center and ten

feet overhead. This maintenance has prevented greater deterioration of the old roadbed. A few trees have established in the roadbed and cut banks, and rocks and deadfall have entered the old roadbed. Sloughing of the cut slope has also taken place (Photo 3-10).

The Golden Hand Mine area includes signs of past mineral activity and occupancy such as a bunkhouse, ice house, cabin, outhouse, and collapsed mill. Old mining equipment, adits, waste rock dumps, and exploration and haul roads are also visible in the area (Photo 3-11). Many of the abandoned exploration and haul roads have become almost impassable, even to those traveling on foot because of the lodgepole pine and dense alder thickets that have become established. Most of the adits have collapsed and the old buildings and structures are in disrepair. Natural processes are clearly at work to re-establish a more natural system.

Northwest of the claims, Trail #013 follows Coin Creek to the Beaver Creek confluence, and ends at the junction with the Chamberlain Trail (Trail #001), approximately 2.5 miles from the Golden Hand Mine site (Figure 3-6).

The Chamberlain Trail is one of the Krassel Ranger District's primary trails that provides the most direct route from the Big Creek/Smith Creek Trailhead to Chamberlain Basin. The Big Creek/Smith Creek Trailhead receives the most amount of wilderness visitor use on the Krassel Ranger District (Big Creek and Krassel District Visitor Use Data Summary, 1974-2001). Based on a registration rate of 30 percent, an average number of 207 private groups entered the FC-RONR Wilderness per year via the Big Creek/Smith Creek Trailhead over the past 20 years (1982-2001), resulting in an average of 5,501 RVDs per year (Big Creek and Krassel District Visitor Use Data Summary, 1974-2001and Wilderness & Recreation Specialist Report).

Mosquito Trailhead, located on FR 373, is another trailhead in the vicinity of the project that is approximately 2 miles from Pueblo Summit. Limited dispersed camping occurs at this trailhead and an outfitter-assigned camp is authorized from September 1 through mid November. This trailhead is another portal into the FC-RONR Wilderness and accesses the Mosquito Ridge area (Trail #003), which offers extensive views into the South Fork of the Salmon River drainage, Beaver Creek drainage, and Chamberlain Basin. Based on a registration rate of 30 percent, 32 private groups entered the FC-RONR Wilderness via the Mosquito Trailhead per year over the past 20 years (1982-2001), resulting in an average of 1,147 RVDs per year (Big Creek and Krassel District Visitor Use Data Summary, 1974-2001 and Wilderness and Recreation Specialist Report).

Outfitter and Guides

There are two Outfitter and Guides that operate in the vicinity of the Golden Hand Mine: Big Creek Lodge & Outfitters, Inc., and Elk Springs Outfitters (Figure 3-7). Pueblo Summit Trailhead has been an access point to the Wilderness for Big Creek Lodge & Outfitters, Inc. on an intermittent basis. This outfitter operates frequently from the Big Creek/Smith Creek Trailhead and operates a camp on Ramey Ridge. Their Special Use Permit and Operating Plan authorizes 330 client service days (any day on the National Forest where an outfitter and guide provides services to a client), most of which occur adjacent to the Golden Hand Mine project area. Elk Springs Outfitters enter the Wilderness from the Mosquito Trailhead where they maintain a transfer camp. An assigned camp is located near Mosquito Springs in close proximity to the divide between the Beaver Creek and South Fork of the Salmon River drainages. Client service activities do occur within the Beaver Creek drainage. Elk Springs Outfitter's Special Use Permit

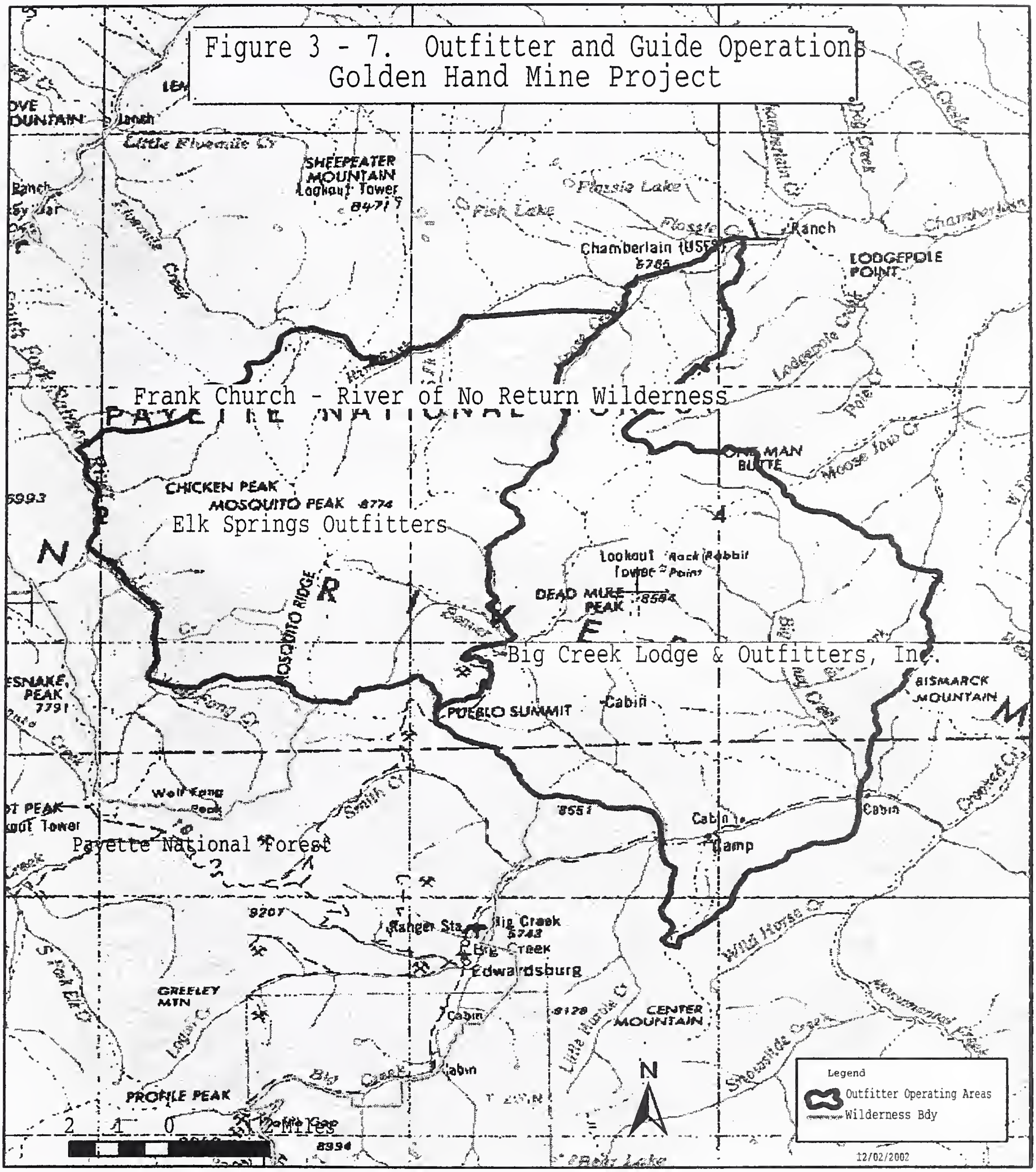


Figure 3 - 7. Outfitter and Guide Operations
Golden Hand Mine Project

and Operating Plan authorizes 285 client service days. Season of use is generally from September 1 through November 18; however, summer use may also occur.

Wilderness Character

Roderick Nash suggests that Wilderness can be defined as a "scale between two poles" where "...wilderness and civilization become antipodal influences which combine in varying proportions to determine the character of an area" (Nash 1982). Wilderness then can be defined as "the range closest to the wilderness pole". Wilderness, therefore, incorporates some elements of civilization or human activity, but it is the limited presence of civilization that lends Wilderness its unique character.

In the immediate area of the Golden Hand Mine site, the wilderness character, represented by natural integrity and untrammeled conditions, has been compromised by past human activity. Evidence of human influences associated with past mining activities is clearly visible and the naturalness of the area has been altered. While these mining remnants provide the Wilderness visitor with a sense of history, these past human-related developments at the mine site compromise the wilderness character of the area by affecting the natural integrity. These effects are localized. Over the entire FC-RONR Wilderness, evidence of past human activities exists. There are 1,398 prehistoric and historic properties that have been identified in the FC-RONR Wilderness (Kingsbury, pers. comm. 2003), approximately 2,400 miles of trail, and approximately 1,400 inventoried camp locations (Wotring, pers. comm. 2003). The passage of time has allowed the natural processes to begin to take over at many of these locations so that untrammeled conditions (freedom from human control) exist.

Wilderness Experience

Currently, there is evidence at the Golden Hand Mine site of previous mining activities. The mine site is an altered environment that has mining remnants such as a waste rock pile, bunkhouse and other facilities, old roads, and adits. To some people, these features at the Golden Hand Mine site represent an environment that has been altered by man, but to others it provides the visitor with a sense of history and independence, which is consistent with the definition of Wilderness in the Wilderness Act. " ...may also contain ecological, geological, or other features of scientific, educational, scenic or historical values" (Section 2. [c]).

Because the mine site is difficult to access (four to five hour drive from McCall, a full service community and a an hour to an hour and a half hike), the sense of remoteness and the opportunity for solitude is high. Although the claims are only a few miles from the Pueblo Summit Trailhead, it is difficult to get to the trailhead. This limited use of the trail and trailhead provides ample opportunities for solitude and a primitive recreation experience in the area.

When traveling through the FC-RONR Wilderness, there is a sense of tranquility, isolation, and independence. There is little evidence of human modernization and mechanization with the exception of aircraft use at designated airstrips and jet boat use along the Salmon River. When leaving the immediate area of the Golden Hand Mine site, signs of human activity lessen and are sporadic. Visitors can expect to see little to no signs of human impact or mechanization within the interior of the FC-RONR Wilderness, and the wilderness experience is quite high.

Photo 3-10. Trail #103 with approximately 6 feet tread width (white road extended to 10 ft)

Photo 3-11. Abandoned roadbed to claim No. 3 south of Trail #013 junction (white rod extended to 12 ft)

Environmental Effects

The effects on the Wilderness resource are difficult to quantify and qualify because of the differing personal views of Wilderness and the complexity of this composite resource (USDA Forest Service 1997). The affected environment described the different indicators used to measure the effects on **wilderness character** and wilderness experience. For some members of the public, the effects on wilderness character tend to be viewed as an absolute, so that simply knowing that activities are taking place in the wilderness is an adverse impact (Hendee et al. 1990). For others, compromises to the Wilderness can be made. The physical effects on wilderness character are disclosed under the Fisheries, Wildlife, and Soil and Water Resources sections, while the social importance of maintaining and protecting a natural ecosystem free from human control and influence, is addressed in this section. The social and spiritual values of Wilderness are highly valued as expressed in the public comments on American Independence Mines and Minerals Inc.'s (AIMM) proposed plan of operation.

The effects to **wilderness experience** are more quantifiable, where the extent of the mining and mining-related activities can have impacts on the visitor's experience of solitude and sense of remoteness, and primitive recreation. Impacts to wilderness experience can be explained using number of vehicle roundtrips, noise, number of operating years, number of operating hours per day, length of operating season, and amount of physical disturbance (including tree removal, drilling and trenching, and amount of new road construction and construction of abandoned roadbeds).

Alternative A (No Action)

There would be no additional adverse effects to **wilderness character** under Alternative A. Since no mining and mining-related activities would take place, the natural and untrammeled conditions would continue to heal and be restored at the Golden Hand site. With no development, no use of mechanized equipment, and no on-site occupancy the FC-RONR Wilderness would continue to be perceived as "an enduring resource" protected for present and future generations. For additional disclosure of the resource effects related to natural integrity see the Fisheries, Wildlife, and Soil and Water Resources sections.

There would be no additional adverse effects to **wilderness experience** under Alternative A. Opportunities for solitude and sense of remoteness, and primitive recreation would be preserved with no mining and mining-related activities. As the Golden Hand Mine site continues to recover naturally from sporadic use over the past century, the wilderness experience is enhanced. The abandoned mining roads are becoming heavily vegetated, and the structures are in various states of decay. Access to the Golden Hand Mine site would continue to be a challenge since the roads to Pueblo Summit would receive little improvements, minimizing visitor use and preserving the sense of remoteness and solitude in the adjacent Wilderness.

Alternative B

The following activities would affect **wilderness character:**

- 4.0 miles of road constructed and used in the FC-RONR Wilderness
- 31 drill sites
- 5 trenches (approximately 750 ft)

- Timber removal on claims
- Motorized access to claims (up to 252 vehicle roundtrips in the FC-RONR Wilderness per year)
- No specified limit on the amount of vehicle or motorized/mechanized equipment use that would occur on and off claims (motorized drill, chain saw, generator).
- Occupancy of bunkhouse
- Use of powder magazine
- Use of existing outhouse

AIMM's proposal would allow for the most extensive amount of physical disturbance to the Wilderness, which would adversely affect wilderness character by allowing for the greatest amount of human influence and control. New construction of roads and construction of abandoned roadbeds in the Wilderness would involve clearing abandoned roadbeds of vegetation and debris. The drilling at 31 sites and excavation of trenches would result in greater access needs and a larger amount of disturbed area. The removal of trees would create stumps that would be evidence of human control and influence at the Golden Hand Mine site. Ground disturbing activities would compromise the preservation of natural and untrammeled conditions in the FC-RONR Wilderness now and for future generations. See the Soil and Water and Fisheries Resources sections for additional discussions of the effects to ecosystem processes.

Alternative B would allow for motorized and mechanized use in the Wilderness, which is not consistent with wilderness character as stated in the Wilderness Act (Sec 2). This use would adversely affect the natural integrity and untrammeled conditions. Motorized and mechanized use represents human influence and human control or "expanding settlement and growing mechanization" (Wilderness Act Section 2 [a]). The vehicle roundtrips to the Golden Hand Mine would result in frequent and consistent motorized entry into the Wilderness (up to 252 vehicle roundtrips in the FC-RONR Wilderness per year). The activities under this alternative could involve unlimited use of motorized and mechanized equipment and vehicle support both on claims and associated off claim roads in the Wilderness. The actual use and the knowledge of these activities would adversely impact the wilderness character by compromising the natural integrity and untrammeled conditions of the FC-RONR Wilderness.

Occupancy of the bunkhouse and use and maintenance of additional permanent structures would adversely affect the natural integrity and untrammeled conditions, as it is demonstrative of an environment influenced and controlled by man. Wilderness is an area "where man is a visitor who does not remain and is an area of …undeveloped federal land retaining its primeval character and influence, without permanent improvements or human habitation…" (The 1964 Wilderness Act, Sec 2[b]).

The following would affect **wilderness experience:**

- Up to 252 vehicle roundtrips into the Wilderness per year (2 per day)
- 4.0 miles of road constructed and used in the FC-RONR Wilderness
- 31 drill sites
- 5 trenches (~750 ft)
- Removal of trees
- 4 months of operation per year
- 10 years of mineral development activity
- Undisclosed length of work day

- Upgrade of FR 371 and 373

The vehicle roundtrips into the Wilderness would adversely affect the wilderness experience. Currently, an estimated 18 groups of recreationists enter the FC-RONR Wilderness annually via the Pueblo Summit Trailhead and along Trail #013. At the current use levels, it is unlikely that visitors see other Wilderness users on the trail between Pueblo Summit and the mouth of Coin Creek. The approximately 252 vehicle roundtrips would adversely affect those seeking solitude and escape from settlement and mechanization in the Beaver Creek and Hand Creek drainages and the surrounding ridge tops that encompass the project area. During the maximum proposed operating season (approximately early July through October) the potential for encountering motorized or mechanized use along Trail #013 from the trailhead to the mine would be high and would greatly impact the sense of solitude and remoteness, and opportunities for a primitive recreation experience. In addition, opportunities to see, hear, or otherwise notice mine related activities would exist from some locations both in and outside of the Wilderness.

An estimated 4.0 miles of road would be constructed and used in the Wilderness, which includes new road construction and construction on abandoned roadbeds (including the 2.7 miles of Trail #013). In addition, 31 drill sites would be drilled, 5 trenches would be excavated, and timber may be removed on claims, leaving stumps. This amount of construction and mining activity would adversely affect wilderness experience. Wilderness was created as an area where man's impacts are unnoticed and where solitude and remoteness, and primeval nature are expected.

The drilling, trenching, cutting timber, and road building would occur under this alternative with the use of mechanized and motorized vehicles, which would result in both noise and dust. The expectation of the Wilderness visitor is to visit a primitive area where one can escape the mechanized and developed world. This would have a large impact on the Wilderness user's sense of solitude and remoteness, and primitive recreation experience in the Beaver Creek and Hand Creek drainages and the surrounding ridge tops that encompass the project area. As the visitor leaves the area, the direct impacts could lessen; however the overall experience could be negatively impacted.

Under this alternative, a 10-year operating period is proposed. The likelihood of encountering motorized and mechanized uses along Trail #013 from the trailhead to the mine is high over a longer period of time, and would affect the wilderness experience within the Beaver Creek and Hand Creek drainages and the surrounding ridge tops that encompass the project area. Generally, access to the FC-RONR Wilderness via Pueblo Summit is from early July to early November, so there would be limited opportunities over the 10 year operating period when the public could visit the area without the mining operations taking place. The longer the operations occur, the longer the impacts would be to the wilderness experience.

The length of operation per day would not be limited under this alternative; therefore Wilderness visitors may experience noise, dust, and lights over a longer duration per day, which would adversely affect solitude and remoteness and opportunities for a primitive recreation experience.

The proposed roadwork on FR 371 and FR 373 would allow easier access to Trail #013, which could encourage an increase in visitation to the adjacent Wilderness. Though it would provide improved access to a primitive recreation experience, it could also have adverse impacts on the sense of solitude and remoteness that currently exists on Trail #013.

In summary, under Alternative B, the Wilderness user would see physical impacts to the land, motorized and mechanized equipment, and hear noise and see dust from these machines from

early July to early November for up to 10 years. This type and amount of development would adversely affect the Wilderness users' sense of solitude and remoteness and enjoyment of a primitive recreation experience in the Beaver Creek and Hand Creek drainages, and the surrounding ridge tops that encompass the project area.

Alternative C

This alternative responds to Wilderness resource protection needs by: prohibiting trenching and removal of trees in the Wilderness; requiring the operators to live outside the Wilderness; limiting the timing and duration of the operations; limiting road construction to 3.4 miles, and limiting off claim road construction.

The following would affect **wilderness character:**

- 3.4 miles of roads constructed and used in the FC-RONR Wilderness
- 31 drill sites
- No trenching
- No tree removal in the Wilderness-trees provided from outside of Wilderness
- Equipment would be washed prior to entering the PNF
- Most development work (road construction, drilling) must occur outside RHCAs
- Motorized access to mine claims (up to 252 vehicle roundtrips in the FC-RONR Wilderness per year)
- No ATVs, motorcycles, or snowmobiles.
- All vehicles would be restricted to the new constructed roads and the roads constructed on abandoned roadbeds
- No occupancy
- No explosives storage on site or in the FC-RONR Wilderness
- Temporary pit toilet
- Fuel storage on claims

Ground disturbing activities would be less than Alternative B. Roads would be constructed; however, there would be approximately 1/2 of a mile less road construction, mostly from areas off claim. New road construction would not be allowed within the RHCA buffer (150 feet for perennial streams, and 100 feet for intermittent streams), which would reduce the adverse effects of the road construction; however, the impacts to natural integrity and untrammeled conditions would remain high. No trenching would occur, but up to 31 drill sites would be allowed. Some Wilderness advocates could feel that the preservation of naturalness and untrammeled conditions would be adversely affected based on their knowledge that mining activities would result in physical disturbance to the Wilderness.

No removal of trees would be permitted to occur in the Wilderness except when presenting a safety hazard along the road. The Forest Service would identify and mark the trees for cutting. Most of the mining work would be limited to outside the RHCAs (see the Fisheries Resource section), and equipment would be washed prior to entering the National Forest. These measures would slightly decrease the impacts to the natural integrity and untrammeled conditions by protecting sensitive areas and preventing the establishment and spread of noxious weeds.

Motorized use would occur in the Wilderness under this alternative. The motorized and mechanized use in the Wilderness would be associated with vehicle access, new road construction, road construction on the abandoned roadbeds, and drilling similar to Alternative B. These activities would adversely affect natural integrity and untrammeled conditions.

Mining operations under this alternative would involve some restrictions to vehicle travel (no travel outside of new constructed roads and roads constructed on abandoned roadbeds), and restrictions on the type of vehicle. This could lessen the perceived impacts to Wilderness character by limiting uses not incident to the mining operation. Some Wilderness visitors could still feel that the preservation of naturalness and untrammeled conditions would be adversely affected based on their knowledge that motorized/mechanized uses occurred in the Wilderness.

Workers would occupy a site outside the Wilderness and would commute to the mine on a daily basis, which would lessen the impacts in regards to human habitation. Human habitation represents an environment controlled and influenced by humans. The storage of explosives would also occur outside of the Wilderness, which would lessen the appearance of permanence and human control. Though use of a temporary pit toilet would increase the appearance of permanence (and would have similar impacts to those described in Alternative B), it would be required to be placed outside the RHCA to minimize impacts to resources, and to be naturalized at the end of each season.

Fuel storage could occur on the claims, which would increase the evidence of human presence in the area of the claims. However, fuel would be required to be stored in containers to protect Forest resources (see Chapter 2, Alternative C).

The following would affect **wilderness experience:**

- Up to 252 vehicle trips into the Wilderness per year (2 per day)
- 4 months of operation
- 3.4 miles of road constructed
- Decreased amount of road construction in the Wilderness
- 31 drill sites
- No trenching
- No tree removal
- Limited work day: one half hour before sunrise to one half hour after sunset
- Restrictions on use of artificial lighting
- Limit on the duration of operations
- No occupancy
- Temporary pit toilet
- Upgrade of FR 371 and 373

The same daily amount of vehicle trips would occur as in Alternative B, and impacts to solitude and remoteness and primitive recreation would be high. The length of the operating season would remain the same as in Alternative B (120 days), which would also limit the Wilderness users' opportunities to visit the area without encountering motorized and mechanized use, dust, and noise.

The new road construction and the road construction of the abandoned roadbeds in the Wilderness would greatly impact the Wilderness user's sense of solitude and remoteness;

however, the decreased amount of new road construction under this alternative would slightly lessen the adverse impacts by decreasing the amount of disturbed area.. There would be approximately 1,100 feet of abandoned roadbed along Trail #013 that would not be constructed and trenches would not be excavated. Although the adverse impacts remain high, this would reduce the adverse impacts to solitude and sense of remoteness with no trenching and less road construction visible from Trail #013. The removal of trees from outside the Wilderness would also reduce the impacts to solitude and sense of remoteness, and primitive recreation under this alternative.

The work day would be limited to one half hour before sunrise to one half hour after sunset. These restrictions on the length of the work day and the use of artificial lighting (no artificial work lighting would be allowed on the claims with the exception of headlamps/flashlights) would decrease the impacts to recreationists by decreasing the amount of time when noise, dust, and other signs of development and mechanization could be experienced by the visitor. The duration of the operation under this alternative would be 3-5 years; therefore the direct effects of noise and encounters with motorized/mechanized use and vehicles would be for a shorter period of time than in Alternative B. Additionally, there is the possibility that natural processes would begin to operate sooner to reestablish a more natural appearing environment. Impacts to solitude, sense of remoteness, and primitive recreation, may be less over the long term under this alternative than Alternative B.

No occupancy would occur under this alternative. There would be no impacts associated with a long-term camp in the Wilderness such as tent sites, sounds, and ground disturbing activities. The lack of evidence of human habitation in the Wilderness would benefit the visitor's solitude and sense of remoteness. A pit toilet would be constructed on the claims (away from Trail #013) to address human waste issues while working on site. This would provide a sanitary method of addressing the human waste issue with benefits to naturalness, and possible remoteness and solitude, but also to others this pit toilet represents permanency, and a lack of solitude, remoteness, and primitiveness.

All other impacts to the wilderness experience would be the same as in Alternative B where the adverse affects to solitude and the sense of remoteness, and opportunities for primitive recreation are high.

As a mitigation measure for the effects to wilderness experience, an interpretive display would be placed at the Pueblo Summit Trailhead for the duration of the operation. The display would inform the public of the activities occurring at the Golden Hand Mine site, including other mitigation measures that would be implemented, a timeline for the proposed operation, and reclamation activities.

Alternative D

This alternative responds more specifically to Wilderness protection needs than any of the other action alternatives. For example, there would be no motorized access into the Wilderness, no road construction in the Wilderness, and no trenching. Refer to the Fisheries and Soil and Water Resources sections for additional discussions on the impacts to ecosystem processes.

The following would affect **wilderness character**:

- No motorized access to the claim
- No roads constructed and used in the Wilderness
- 14 drill sites
- No trenching
- Removal of trees
- No motorized or mechanized equipment use off claims
- No motorized or mechanized equipment use in association with occupancy
- Occupancy on claim-primitive tent camp
- Temporary pit toilet
- Fuel storage on claims

Like Alternatives B and C, Alternative D would allow development of the mineral resource; but Alternative D limits the impacts to natural integrity and untrammeled conditions by limiting access and development. Access to the mine would be by primitive (non-motorized) means; therefore no new roads or road construction of abandoned roads would occur in the Wilderness. Impacts associated with drilling would still occur under this alternative, however, there would be less drill sites, and drilling would be sequenced so that the area of physical disturbance would be limited to the area in and around the inferred ore deposit. No trenching would occur, resulting in a reduced area of physical disturbance, and decreased evidence of human control and influence. Tree removal may occur on the claims and would have the same effects to wilderness character as described under Alternative B; however, no tree cutting is permitted in the RHCAs.

This alternative would lessen the impacts to the natural integrity and untrammeled conditions of the area by having a smaller area subject to human control and human influence. The knowledge that no roads would be constructed and less drilling would occur, and would result in less physical disturbance, could be perceived by some as minimizing the effects to the wilderness character. Others could feel, however, that any mine development would have adverse affects on wilderness character.

A motorized packable drill would be transported to the Golden Hand Mine on horses and/or mules to alleviate the need for vehicle entry into the Wilderness. This drill would be used at the mine site, and horses and mules could move gear and equipment on the claims, consistent with the wilderness character. All clearing of Trail #013 would be conducted using non-motorized and non-mechanized means. A motorized drill, chain saw, and generator would be used; however, this use would be limited to the claims and associated only with mining activities.

Any use of motorized and mechanized equipment in Wilderness could be perceived by some as adversely impacting the wilderness character however, others could feel that limiting the use to the claims would have less of an impact on wilderness character.

Alternative D would allow a long-term seasonal camp and a pit toilet facility to be located on a valid claim for the workers to reside during the operating season. The effects to wilderness character would be similar to those under Alternative B where occupancy in the Wilderness represents and is evidence of human habitation, human control, and human influence. However, under this alternative, living conditions would be primitive and subject to the same regulations as outfitter camps that provide client services in the Wilderness (Appendix C). Any long-term camp would impact the land and have an effect on the physical resource. No motorized or mechanized use would occur in support of this camp. Effects from the fuel storage would be similar to Alternative C.

For **wilderness experience**, adverse effects to solitude and sense of remoteness, and primitive recreation would be less under Alternative D than the other action alternatives.

The following would affect **wilderness experience:**

- No motorized access to the claims
- No road construction or use in Wilderness
- No trenches
- 14 drill sites
- Removal of trees and brush for foot and/or stock trails
- Tree removal for mining purposes (may be authorized)
- 4 months operating season
- Limited work day: one half hour before sunrise to one half hour after sunset
- Limit on duration of operations
- Restrictions of use of artificial lighting
- Occupancy on claim-primitive tent camp
- Extended period of stock-holding on site
- Upgrade of FR 371 and 373

No motorized access would occur; therefore no new road construction and construction of abandoned roadbeds would be necessary, which would greatly reduce the impacts to Wilderness visitors' experience as compared to Alternative B and C. No trenching and a reduced amount of drill holes would occur under this alternative. Drilling would be sequenced and limited to an area in and around the inferred ore deposit. Foot or stock trails would need to be identified and flagged to access the drill sites, which would require removal of trees and brush, and construction of benches. This could impact solitude and the sense of remoteness; however, these activities would have much less of an impact than the activities described under Alternatives B and C. In addition, non-motorized access and trail construction are more in keeping with the primitive nature of the Wilderness.

Tree removal on the claims may be authorized for use in mining operations, and could impact a Wilderness visitor's sense of solitude and remoteness (see Alternative B discussion).

Limiting the work day and the duration of operations and restricting the use of artificial lighting would also reduce impacts to the Wilderness visitor's experience (see Alternative C discussion).

Alternative D would allow occupancy on a valid claim at the Golden Hand Mine area in a primitive tent camp situation. The Wilderness Act specifically states that Wilderness areas are without "permanent improvements or human habitation", but it also states "mining locations lying within the boundaries of said wilderness shall be held and used solely for mining or processing operations and uses reasonably incident thereto". From a wilderness experience perspective, the benefit of occupancy would be fewer impacts to solitude along Trail #013, as less commuting would occur to and from the trailhead and no vehicle use would occur. Trail #013 is compacted and stable, and while increased horse or foot traffic would most likely have little physical impacts to the trail, it could impact the solitary experience currently available on Trail #013 where trail encounters are minimal. However, encounters with stock parties are expected throughout the FC-RONR Wilderness and is consistent with the primitive recreation experience in the FC-RONR Wilderness.

The negative impacts regarding occupancy on claims are that the occupancy would be in the FC-RONR Wilderness, detracting from the solitude and sense of remoteness. There would be impacts to those who go off trail and encounter this camp; however, if the camp is properly situated away from the trail, this would be unlikely. Stock would be held on-site which could result in other impacts to the Wilderness environment. Compacted and highly disturbed sites would occur where stock is held for periods of time. Stock use and care would be consistent with Leave No Trace stock use principles to lessen the impacts to other visitors and the land. The camp would be subject to the same standards as private or outfitter Wilderness camps (Appendix C).

As a mitigation measure for the effects to wilderness experience, an interpretive display would be placed at the Pueblo Summit Trailhead for the duration of the operation. The display would inform the public of the activities occurring at the Golden Hand Mine site, including other mitigation measures that would be implemented, a timeline for the proposed operation, and reclamation activities.

Cumulative Effects

When considering the cumulative effects of the proposed project, including road building, ground disturbance, motorized and mechanized uses, and access into the FC-RONR Wilderness, other impacts to the wilderness character and environment must be considered. Ongoing and foreseeable future actions that are potentially cumulative with the indicators tracked in this DEIS are described below.

Throughout the FC-RONR Wilderness there are signs of human impacts resulting from current and past occupancy and use of the land. For example, there are 1,398 prehistoric and historic properties identified in the FC-RONR Wilderness and approximately 1920 inventoried camp locations. These sites are recognized in the Central Idaho Wilderness Act as conforming activities.

The Central Idaho Wilderness Act allows for a number of "nonconforming" activities in the FC-RONR Wilderness. These uses include jet boating on the Salmon River and the landing of aircraft at a number of private, state, and federal landing strips within the Wilderness. Currently, there are eight airstrips operated by the Forest Service for public use in the FC-RONR Wilderness, all of which provide motorized access into the interior of the Wilderness. It is likely that these uses will continue to increase and impact both wilderness character and wilderness experience.

Outfitter and Guide activities, recreation use, research activities, noxious weed control, fire management, airstrip maintenance, search and rescue, trail maintenance, and cultural resource management activities can contribute to cumulative effects on wilderness experience and wilderness character. Requests for motorized equipment and mechanized transport in the Wilderness occurs on an annual basis. The Forest Service line officer may approve emergency use of helicopters, pumps, and chain saws on a case-by-case basis for Forest Service fire management activities and county search and rescue operations. Outfitter and Guides, aviators, and Forest Service personnel may request the use of motorized and/or mechanized equipment such as wheelbarrows, chain saws, rock drills, and generators for non-emergency purposes. Other agencies and researchers request the use of motorized and mechanized access or equipment

in the Wilderness. It is reasonably foreseeable that the number of requests and approvals will continue to increase, with cumulative impacts to wilderness character and experience.

During fiscal year 2002, there were 49 authorizations for administrative motorized or mechanized use in the FC-RONR Wilderness with a total of 40 days authorization (USDA 2002, FC-RONR Wilderness Management Record Summary). The extent of illegal motorized and mechanized intrusions into the FC-RONR Wilderness is unknown.

In addition to the activities described above, political pressures, and a growing population, other reasonably foreseeable activities that could contribute to cumulative effects to wilderness character and experience are the proposed exploration work on claims No's. 1 and 2, further development of claim No's. 3 and 4, and the implementation of a new FC-RONR Wilderness Management Plan (Appendix A).

Alternative A would not contribute to cumulative effects to wilderness character or wilderness experience over the entire FC-RONR Wilderness beyond the past, present, or foreseeable future activities.

Alternatives B and C would allow for 80 additional days of motorized or mechanized use in the Wilderness that would extend over an estimated 3 mile area in addition to the 40 acres of the claims. This would result in three times as many days of motorized /mechanized use as fiscal year 2002.

Alternative D would allow for 80 additional days of motorized or mechanized use, however, the use would be limited to the 40 acres of the claims.

The National Wilderness preservation system was created to "assure that an increasing population accompanied by expanding settlement and growing mechanization, does not occupy and modify all areas within the United States..." (The Wilderness Act, 1964). The incremental degradation of Wilderness throughout the country by allowing increases in mechanized and motorized uses, human habitation, and development tends to weaken the integrity of Wilderness.

Irreversible and Irretrievable Commitments

Under the action alternatives, the further degradation of the physical landscape within the project area could result in irreversible impacts to the natural integrity of the area.

Irretrievable losses would occur to the untrammeled conditions and to wilderness experience during and after the period of operation.

Payette National Forest Management Plan and FC-RONR Wilderness Management Plan Consistency

The Payette National Forest Land and Resource Management Plan (1988, as amended) incorporates direction from the Frank Church-River of No Return Wilderness Management Plan (1985, as amended) by reference (Chapter 1, page 2). Alternative A (No Action) would meet the Wilderness management goal to manage "for a broad range of land uses and recreation

opportunities in a manner that will leave it unimpaired for future use and enjoyment as wilderness." (FC-RONR Wilderness Management Plan, p. II-15).

While Alternative A is consistent with the purpose of the 1964 Wilderness Act, "...to assure that an increasing population, accompanied by expanding settlement and growing mechanization, does not occupy and modify all areas within the United States...", this Act specifically allows for mineral development on valid claims discovered prior to December 31, 1983 as long as :

> Mining locations lying within the boundaries of said wilderness areas shall be held and used solely for mining or processing operations and uses reasonably incident thereto... (Public Law 88-577, The Wilderness Act, 1964 (Section 4[d]).

The alternatives that allow motorized access and road construction in Wilderness (Alternatives B and C) are not consistent with the Wilderness Plan. The Plan states "...reasonable access cannot be denied, but should be located to have the least long lasting impact on wilderness values... where the use of motorized access...to claims shall be authorized when essential...". Based on the Surface Use Analysis stating that "..trenching is not reasonably incident ...at this time" (see Appendix B), motorized access is not essential or reasonable based on the amount and type of development work proposed. Alternative D however, best meets Wilderness Plan direction.

Of the action alternatives, Alternative D meets the objectives of the Minerals and Energy section of the Wilderness Plan more than the other action alternatives, where direction includes:

- Harmonize operations with scenic values to the extent possible;

- Utilize design, location and screening to blend structures and improvements (including roads) with the landscape, and;

- Minimize lasting evidence of timber removal; avoid making obviously artificial openings, and cut stumps as close to the ground as practicable.

Occupancy of the bunkhouse or a camp on the claims is inconsistent with the Wilderness Act which defines Wilderness as "...an area of undisturbed Federal land retaining its primeval character and influence, without permanent improvements or human habitation...". In addition the act states "mining locations lying within the boundaries of said wilderness areas shall be held and used solely for mining or processing operations and uses reasonably incident thereto...". Based on the proximity of the mining claims to the Wilderness boundary, and a reasonable commuting time being identified as 1.5 hours, occupancy under Alternative B does not meet direction while Alternative D would, based on an average hiking time of 2 miles per hour.

The FC-RONR Wilderness Management Plan states:

> Accommodate and administer those non-conforming uses provided for in the Wilderness Act and Central Idaho Wilderness Act in a way so as to minimize their impact on the wilderness resource and values.

Alternative D is most consistent with this direction.

All action alternatives except Alternative B (Proposed Plan) would meet FC-RONR Management Plan direction to inform Wilderness visitors of mining operations that may impact their

wilderness experience, in order to provide for safety and reduce the possibility of conflicts (FC-RONR Wilderness Management Plan, p. 43)

Specialist Report

This DEIS hereby incorporates by reference the Wilderness and Recreation Specialist Report in the Project Record (40 CFR 1502.21). The Wilderness and Recreation Specialist Report is located in Section 5(7) of the Project Record and contains the detailed data, methodologies, analyses, conclusions, maps, references, and technical documentation that the Wilderness Specialist relied upon to reach the conclusions presented in this DEIS.

Soil and Water Resources

Scope of the Analysis

Issue #5: The effects of the proposed activities on water quality

Indicators

- Estimated change in delivered sediment
- Risk of metal contamination

Background

Sediment, metals, and fuels are the primary contaminants of concern when dealing with potential mining impacts to water and fishery resources. Sediment can be generated from road construction and other ground disturbing activities, metals can be released from mineralized rock through mining and drilling activities, and fuels stored on site can be spilled into surface drainages.
Claim development activities, including road construction, road maintenance, drilling, and trenching, may affect beneficial uses in streams in the project area. These activities expose soils to the erosive forces of water, potentially increasing soil erosion and sediment delivery to streams and wetlands (Gucinski et al. 2001). Excessive sedimentation can increase width/depth ratios, reduce pools, and increase fine sediment on the streambed, which can adversely affect cold-water biota and other beneficial uses (Gucinski et al. 2001).

Roads are generally the primary source of accelerated erosion and management-related sediment on National Forests (Gucinski et al. 2001). The areas of highest sediment delivery are within Riparian Habitat Conservation Areas (RHCA) where roads either run parallel to or across streams and wetlands. Roads expose the soil to erosion, reduce infiltration, increase the slope angle on cut and fills, alter surface and subsurface water flow, and concentrate water. Road construction is typically the largest contributor to sediment production. Accelerated erosion is greatest within the first 2 to 3 years after construction, and decreases over time as disturbed areas settle, coarser materials are exposed, and vegetation becomes established (Megahan and Kidd 1972. Much of the initial increase in sediment is the result of surface erosion on exposed road fills. Sediment production and delivery has also been correlated with traffic volume (Reid and Dunne 1984), however, increases in traffic projected for this proposal are probably not high enough to cause large increases in sediment production (Elliot, pers. comm. 2002).

Potential sediment delivery will be analyzed using the WEPP: Road interface model (Elliot et al.1999) and by describing the amount and condition of stream crossings and roads.

Mining operations may result in the release of metals to surface water and groundwater. The ore at the mine contains sulfide minerals and may have the potential to generate acid and dissolved metals. Mining exposes sulfide minerals to air, sulfuric acid is produced, and dissolved metals are liberated into the water. Sources of metals could be from the waste rock pile or from water discharges from the underground workings.

Mining operations require fuel to run equipment and additives may be used for drilling. Without proper measures, these chemicals could spill into streams. Chemical contamination from fuels and drilling additives is addressed in the Fisheries Resource section.

Major Comments: Public, agency, organization, and Tribal Government comments regarding effects to soil and water focused on how water quality would change with adoption of action alternatives including potential violations of Idaho's antidegradation policy. Concerns about effects to water quality focused on sediment, mining-related chemicals (including fuel), and the potential for acid mine drainage. Comments advocated the use of Best Management Practices to protect water quality. Concern was expressed about effects to RHCAs and water quantity on the adjacent streams. Effects to RHCAs, water quantity, and chemical (as opposed to metal) contaminants were addressed in the Fisheries Resource section.

Issue #6: The effects of the proposed activities on wetlands and riparian zones.

Indicators

- Amount of wetlands and riparian zones affected

Background

Riparian zones are management zones that combine the ecological concerns of riparian ecosystems with the hydrologic concerns of floodplains and streamside slopes. Management direction is found in the Forest Plan (USDA 1988, as amended). Wetlands are areas that have characteristics that support a prevalence of vegetation that is typically adapted for life in saturated soil conditions. Wetlands generally include marshes, bogs, and stream shallows. Activities such as tree removal, road construction and reconstruction, and placement of fill material may affect the ecological functions of wetlands. Wetlands are regulated under Section 404 of the Clean Water Act and Executive Order 11990. The proposed road construction and drilling associated with mining could remove vegetation and place fill material in and around stream courses and riparian areas, which may affect riparian function.

Major Comments: Public, agency, organization, and Tribal Government comments on wetlands and riparian zones focused on impairment or loss of wetlands.

Management Direction

Forest Plan Direction

Water quality will meet or exceed Idaho Water Quality Standards for the protection of beneficial uses (USDA 1988, p. IV-70). Riparian areas will be managed to maintain or improve riparian-dependent resources. Monitoring activities will be conducted on select sites to evaluate the implementation and effectiveness of management practices.

The Forest Plan has been amended to include goals, objectives, standards, and guidelines for protection of anadromous and inland fisheries as defined in the *Interim Strategies for Managing Anadromous Fish-producing Watersheds in Eastern Oregon and Washington, Idaho, and Portions of California* (known as "PACFISH") (USDA and USDI 1995) and the *Inland Native Fish Strategy* (known as "INFISH") (USDA 1995). Both are interim habitat protection and restoration strategies designed to protect and improve aquatic health using Riparian Habitat

Conservation Areas (RHCA) and Riparian Management Objectives (RMO). PACFISH direction applies to the project area. PACFISH identifies Riparian Habitat Conservation Areas (RHCAs) that are administratively delineated areas encompassing all terrain within a band of specified width along each side of a stream or wetland. RHCAs are buffers that protect streams from non-channelized sediment inputs, act as source of wood, and provide other necessary ecosystem functions. RHCAs minimize the likelihood of non-channelized flow reaching any stream and becoming channelized flow. They have been shown to be wide enough to prevent non-channelized sediment from reaching fish-bearing streams. Based on PACFISH direction, widths for RHCA stream buffers in the analysis area are 100 feet on non-perennial streams and around wetlands, 150 feet on non-fish-bearing perennial streams, and 300 feet on fish-bearing perennial streams (USDA and USDI 1995).

As directed by the Forest Plan as amended by PACFISH, for each existing or planned road, the Riparian Management Objectives (RMO) must be met by minimizing road locations in Riparian Habitat Conservation Areas (RHCA) and establishing and developing RMOs for each road, including preparation of road design criteria, elements, and standards that govern construction and reconstruction (USDA and USDI 1995). Sediment delivery to streams from road surfaces should be minimized through outsloping of the roadway surfaces, providing proper road drainage, minimizing disruption of natural hydrologic flow paths, and restricting sidecasting. New and existing culverts, bridges and other stream crossings should be designed to accommodate a 100-year flood, including associated bedload and debris. Crossings should be constructed and maintained to prevent diversion of streamflow out of the channel and down the road in the event of a crossing failure. Fish passage must be provided and maintained at all road crossings of existing and potential fish bearing streams (USDA and USDI 1995). Compliance with this direction is addressed in three other resource sections: Fisheries, Roads and Access Management, and Minerals and Geology, and described in the BMP's included in Alternatives C and D.

Frank Church River of No Return Wilderness Management Plan

Soil and Water Objective: Preserve water bodies and stream courses in their natural state, and ensure that soil formation, alteration, and erosion occur at a rate not noticeably affected by human activity (USDA 1985, p. 37).

Regulatory Framework

Congress intended the Clean Water Act of 1972 (Public Law 92-500) as amended in 1977 (Public Law 95-217) and 1987 (Public Law 100-4) to protect and improve the quality of water resources and maintain their beneficial uses. The Clean Water Act (Section 313) and Executive Order 12088 of January 23, 1987 address Federal agency compliance and consistency with water pollution control mandates. Agencies must be consistent with requirements that apply to "any governmental entity" or private person. Compliance is to be in line with "all Federal, State, interstate, and local requirements, administrative authority, and process and sanctions respecting the control and abatement of water pollution".

a. Compliance with State requirements for protection of waters within Idaho (Idaho Administrative Code IDAPA 58.01.02) means that "The existing instream water uses and the level of water quality necessary to protect the existing uses shall be maintained and protected" and "wherever attainable, surface waters of the state shall be protected for beneficial uses, which for surface waters includes all recreational use in and on the water surface, and the preservation and propagation of desirable species of aquatic life." Further, the Department shall "assure that there shall be achieved the highest statutory

and regulatory requirements for all new and existing point sources, and cost-effective and reasonable best management practices (BMPs) for nonpoint source control". Big Creek, the receiving drainage of Coin and Smith Creeks, is designated as a Special Resource Water by the State of Idaho (Idaho APA 58.01.02).

The Clean Water Act (Sections 208 and 319) recognized the need for control strategies for nonpoint source pollution. The National Nonpoint Source Policy (December 12, 1984), the Forest Service Nonpoint Strategy (January 29, 1985), and the USDA Nonpoint Source Water Quality Policy (December 5, 1986) provide a protection and improvement emphasis for soil and water resources and water-related beneficial uses. Soil and water conservation practices (BMPs) were recognized as the primary control mechanisms for nonpoint source pollution on National Forest System lands. The Environmental Protection Agency supports this perspective in their guidance, "Nonpoint Source Controls and Water Quality Standards" (August 19, 1987).

The Forest Service must apply Best Management Practices (BMPs) to achieve Idaho Water Quality Standards. The site-specific application of BMPs, with a monitoring and feedback mechanism, is the approved strategy for controlling nonpoint source pollution. BMPs have been incorporated into this project in Alternatives C and D as described in Chapter 2 and Appendix D.

PACFISH standards and protection of RHCAs, as well as mitigation measures for road construction and maintenance applied in Alternatives C and D (Chapter 2), comply with State of Idaho standards and meet the intent of the Antidegradation Policy. Streams in the analysis area are “Tier 2 Waters” as defined in the CWA and must be maintained and protected unless an analysis and public review process concludes that the degradation is necessary for social and economic reasons, and that other less degrading Alternatives are not available (IDAPA 58.01.02[051]). This document discloses management requirements and additional mitigation in Alternatives C and D that minimize degradation of Tier 2 waters.

Construction or maintenance of Forest roads, or temporary roads for moving mining equipment qualify for an exemption from Section 404 dredge or fill permitting requirements, in waters of the United States including wetlands (404)(f)(1)(A), if they are constructed and maintained in accordance with BMPs to assure that flow and circulation patterns and chemical and biological characteristics of the waters are not impaired (404)(f)(1)(E). Alternatives C and D incorporate BMPs and would meet this definition. Alternative B does not include the use of BMPs. The Army Corp of Engineers (COE) is responsible for determining which activities require a 404 permit and which acticities (if any) would qualify for an exemption.

Designated Beneficial Water Uses

According to Idaho Administrative Code IDAPA 58.01.02, streams in the analysis area are nondesignated surface waters and, as such, are protected for beneficial uses, which include all recreational use in and on the water and the protection and propagation of fish and wildlife, wherever attainable. Because waters in the analysis area support cold-water aquatic life and primary or secondary contact recreation beneficial uses, the State of Idaho applies cold-water aquatic life and primary or secondary contact recreation criteria to these waters. The streams in the analysis area are also protected for bull trout spawning and rearing. Water temperatures cannot be caused to exceed twelve degrees Celsius daily average during June, July, and August for juvenile bull trout rearing; and nine degrees Celsius daily average during September and October for bull trout spawning. Effects to water temperature and fish are discussed in the Fisheries Resource section and Fisheries Specialist Report.

It is not known if streams in the analysis area are fully supporting beneficial uses. The only waterbody assessed by Division of Environmental Quality (DEQ) in the Lower Middle Fork Salmon HUC has been Monumental Creek, and it has been listed on the 1998 303 (d) list as impaired for sediment. Streams in the analysis area could be placed on the list if DEQ does an assessment and finds impairment to beneficial uses such as temperature violations for cold water aquatic life or salmonid spawning, or possibly sediment impairment if it can be directly linked to beneficial use impairment (M. Bridges, pers. comm. 2002).

The Clean Water Act Section 303(d) and 40 CFR (Part 130) require each state to identify waterbodies that are water quality limited. Currently, based on the latest approved 1998, State of Idaho 303(d) list there are no listed waterbodies within the analysis area.

Analysis Area

The analysis of direct and indirect effects to soil and water resources focuses on the project area from the Walker Millsite to the area of the claims (Figure 1-2, Chapter 1). This area includes FR 343, 371, and 373 to Pueblo Summit and the access route down FS Trail #013 to the claims. The analysis area for cumulative effects to soil and water resources includes five subwatersheds: Upper Beaver Creek, Lower Beaver Creek, Smith Creek, Hogback-McFadden, and Logan Creek (Figure 3-8). These 6th level USGS hydrological units (HUCs) are located within the Lower Middle Fork Salmon River Watershed (4th level HUC).

The Golden Hand claims are located at an elevation of approximately 7,000 feet within the FC-RONR Wilderness in the Coin Creek drainage, a tributary to Beaver Creek in the Upper Beaver Creek subwatershed (Figure 1-2, Chapter 1). Inside the Wilderness, the trail (#013) to the mine site does not cross any drainage until it reaches tributaries to Coin Creek at the claims. Coin Creek is located near the western edge of the claims. Access roads to the trailhead at Pueblo Summit (FR 371 and 373) follow Smith Creek and the North Fork Smith Creek and cross several perennial and intermittent streams, springs, and wetlands (Figure 3-9). FR 371also travels along Big Creek from near the confluence of Smith Creek with Big Creek to the confluence of Logan Creek with Big Creek. FR 343 travels along Logan Creek to the Walker Millsite.

Affected Environment

Past Actions that have Affected the Current Condition

Historic mining in the area of the claims has resulted in roadbeds and mining disturbance which may affect the current condition. Sediment delivery to Coin Creek may be higher than natural conditions where channel widening has resulted at abandoned road stream crossings. Vegetation has reestablished on historic disturbances stabilizing soils in the area.

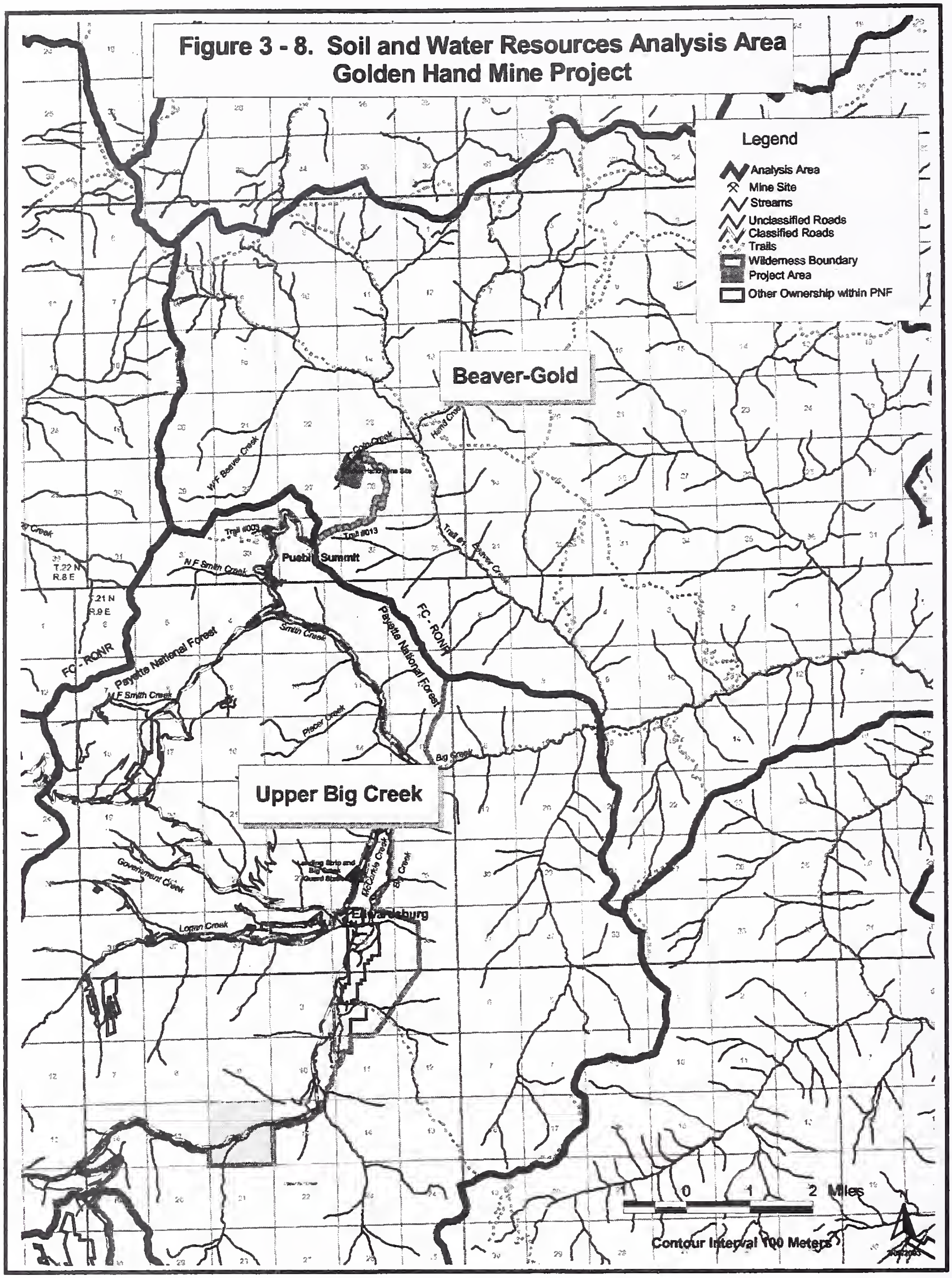


Figure 3 - 8. Soil and Water Resources Analysis Area
Golden Hand Mine Project
Legend
Analysis Area
Mine Site
Streams
Unclassified Roads
Classified Roads
Trails
Wilderness Boundary
Project Area
Other Ownership within PNF
Beaver-Gold
Upper Big Creek
W.F Beaver Creek
Trail #013
Pueblo Summit
N F Smith Creek
FC - RONR
Payette National Forest
Smith Creek
Placer Creek
Big Creek
Government Creek
Logan Creek
McCorkle Creek
Edwardsburg
T.22 N
R.8 E
T.21 N
R.9 E
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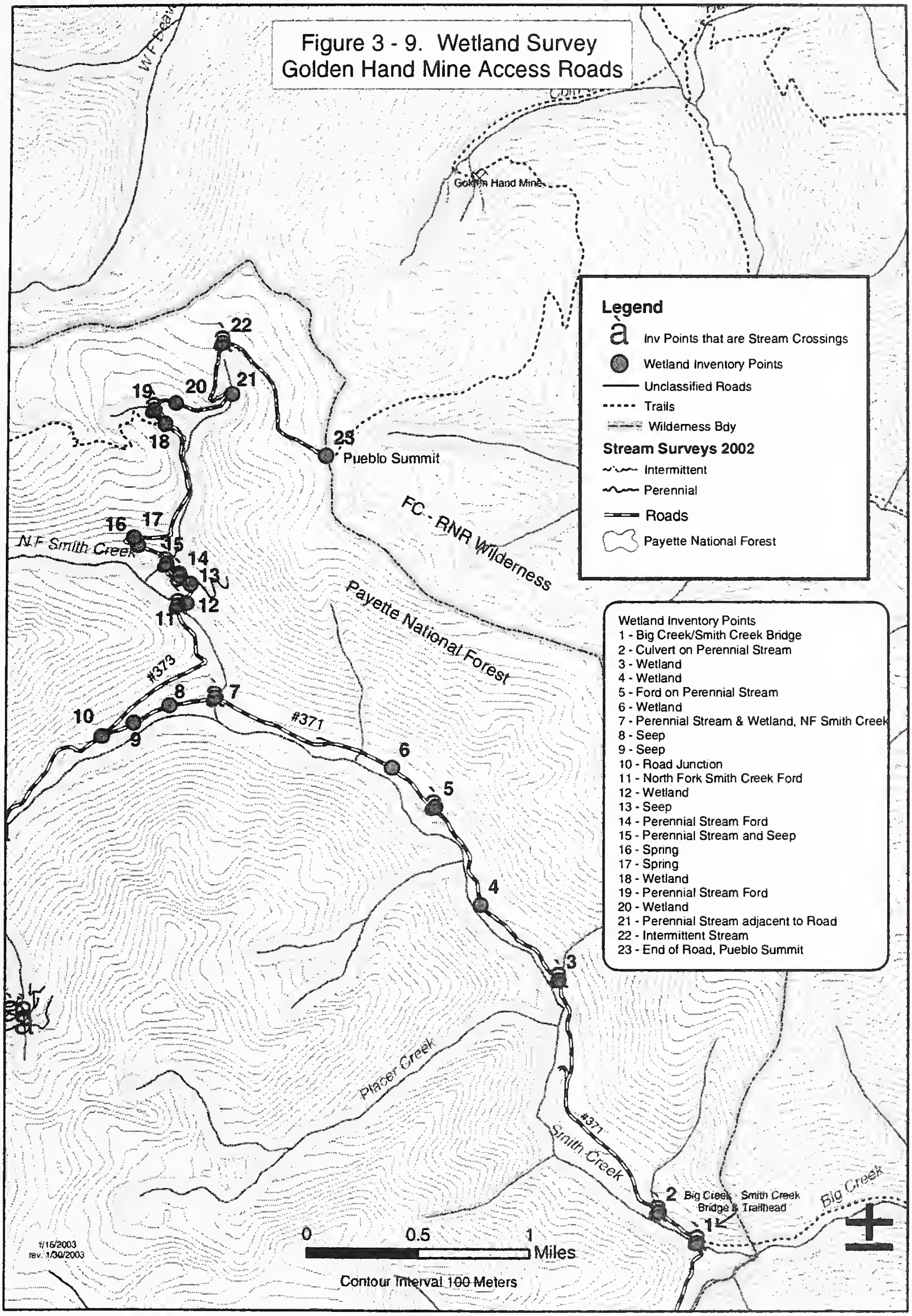


Figure 3 - 9. Wetland Survey
Golden Hand Mine Access Roads
Legend
Inv Points that are Stream Crossings
Wetland Inventory Points
Unclassified Roads
Trails
Wilderness Bdy
Stream Surveys 2002
Intermittent
Perennial
Roads
Payette National Forest
Wetland Inventory Points
1 - Big Creek/Smith Creek Bridge
2 - Culvert on Perennial Stream
3 - Wetland
4 - Wetland
5 - Ford on Perennial Stream
6 - Wetland
7 - Perennial Stream & Wetland, NF Smith Creek
8 - Seep
9 - Seep
10 - Road Junction
11 - North Fork Smith Creek Ford
12 - Wetland
13 - Seep
14 - Perennial Stream Ford
15 - Perennial Stream and Seep
16 - Spring
17 - Spring
18 - Wetland
19 - Perennial Stream Ford
20 - Wetland
21 - Perennial Stream adjacent to Road
22 - Intermittent Stream
23 - End of Road, Pueblo Summit
Golden Hand Mine
Pueblo Summit
FC - RNR Wilderness
Payette National Forest
NF Smith Creek
#373
#371
Placer Creek
Smith Creek
Big Creek
Big Creek - Smith Creek Bridge & Trailhead
0
0.5
1
Miles
Contour Interval 100 Meters
1/16/2003
rev. 1/30/2003

Existing Condition

Climate

The climate varies with the elevation and topography of the area. Annual precipitation in the analysis area ranges from 30 to 50 inches depending on elevation. About two-thirds of the annual precipitation falls between October and March. A secondary peak of precipitation occurs in May and June due to thunderstorms and upper-level low-pressure systems. Temperatures also vary dramatically. Minimum temperatures in January average about 4 degrees F, while maximum temperatures in July average 73 degrees F. Most of the annual precipitation, particularly in the high country, falls as snow in the winter (from Big Creek Summit SNOTEL Station historical data, Western Regional Climate Center –http://wrcc.sage.dri.edu, and USDA 2001).

Drainage Basin Description and Streamflow Regime

The Golden Hand No. 3 and No. 4 lode mining claims are located at the contact of the Yellowjacket formation and granite of the Idaho batholith. The Yellowjacket formation near the mine consists of schist, argillite, and quartzite. The Pueblo Summit Road (FR 373) is on biotite phyllite. Sediment production and delivery from these nongranitic rocks is lower than from granitic rocks of the Idaho batholith (USDA 1999). The access road along Smith Creek is located on alluvial deposits. Aspects in the claim area are generally northeast and aspects along the access road in the Smith River drainage are generally south to southeast. Vegetation is dense and dominated by coniferous trees. Coin Creek and the North Fork Smith Creek watersheds are steep, with moderately dissected slopes. Valley materials vary from bedrock to residual soils occurring as colluviums, landslide debris, and glacial deposits.

Payette National Forest (PNF) fisheries technicians and Raleigh Consultants conducted R1/R4 Fish Habitat Inventories (USFS 1997) on Coin Creek, Beaver Creek, Smith Creek and North Fork of Smith Creek in 1993, 1994, and 2002 (Fisheries Resource section, Project Record). These inventories classified streams into types based on Rosgen (1998) and assessed the physical habitat using methods detailed in the USFS Region 1 and 4 Draft Fish Habitat Inventory Handbook FSH 2609.23: "Type A" streams are steep gradient (greater than 4 percent), confined channels, "Type B" streams are moderate gradient (1.5 to 4 percent), moderately confined channels, and "Type C" streams are low gradient (greater than 1.5 percent) and unconfined channels.

In 2002, PNF specialists inventoried wetlands and assessed road and stream crossing conditions along the access roads (FR 371, 373, 343, and FS Trail #013) and the abandoned roadbeds on and near the claims. Information was collected on streams, riparian areas, and wetlands including stream channel characteristics and wetland size and type (Figures 3-9 and 3-10).

Coin Creek: Coin Creek is steep (Type A), deeply entrenched, and exhibits step/pool channel morphology with gradients ranging from 10 to 30 percent. No fish were observed above 6600 feet elevation. (R1/R4 Survey 2002, on file, Payette National Forest). The channel materials in Coin Creek are unconsolidated, noncohesive materials dominated by boulders and cobbles but also containing gravel. Only 2 percent of the streambed materials are composed of fines. Streambanks are generally stable and contribute little to sediment supply (Raleigh 1994).

Claim Area Streams: Two unnamed intermittent and one unnamed perennial streams are located within the area of the claims in the headwaters of Coin Creek (Figure 2-1, Chapter 2). These are

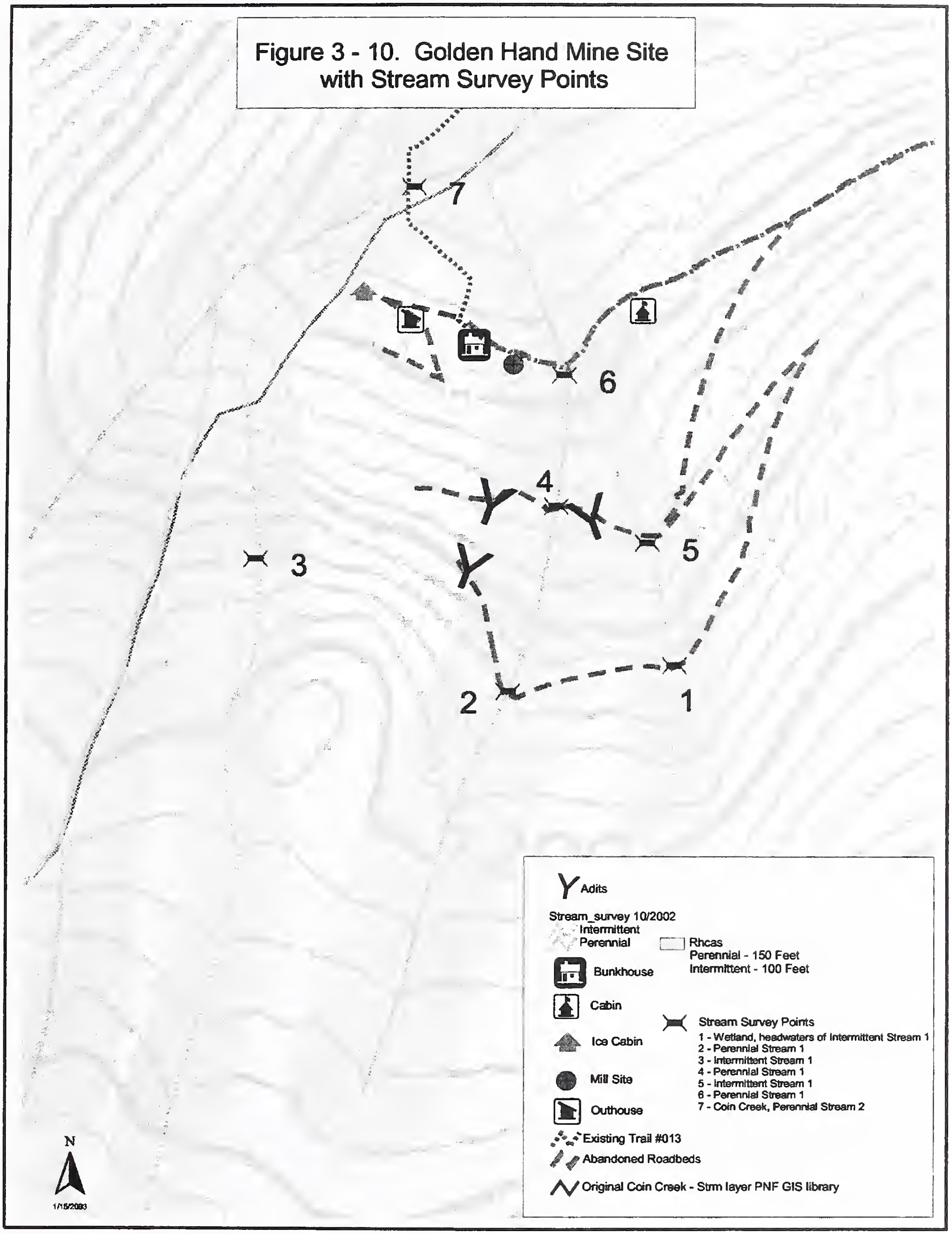


Figure 3 - 10. Golden Hand Mine Site with Stream Survey Points

rated as stream types A3a and A4a, with mostly good stability ratings (USFS Region 1 and 4 Draft Fish Habitat Inventory Handbook FSH 2609.23; Golden Hand Wetland Survey 2002, Project Record). One isolated section of perennial stream near the bunkhouse at the mine site received a "fair" stability rating due to vulnerable fine-grained streambanks, bank cutting, and low residual pool volume. Riparian vegetation is generally dense. Dominant species include Engelmann spruce, lodgepole pine, alder, ribes sp., dogwood, willow, saxifrage, meadowrue, arrowleaf groundsel, pyrola, and horsetail (Golden Hand Wetland Survey 2002, Project Record).

Beaver Creek: Beaver Creek, below the confluence with Coin Creek, is a perennial, fish-bearing Type B stream with a gradient of about 2 percent. The stream flows through a canyon with steep valley walls. Streambed material is composed of boulders, cobbles, and gravel. Less than 4 percent of the bed material consists of fines. Streambed morphology is predominantly rapids and a few irregularly spaced pools (Raleigh 1994).

Smith Creek: Smith Creek below the confluence of the North Fork is a perennial, fish-bearing, moderate size stream, flowing through a moderate gradient (3-5 percent) valley. The stream channels are classified as both Type A and Type B. The channel bed morphology in the Type A reaches is dominated by cobble and gravel, and is characterized by a series of high gradient riffles and cascades with frequent pools. The Type B reaches are characterized by low gradient riffles with irregularly spaced pools. Approximately 6 percent of the bed material consists of fines. The bed and bank materials in both channel types are stable and contribute only small quantities of sediment during runoff events (Raleigh 1994).

North Fork Smith Creek: The North Fork Smith Creek is a small, shallow, steep, perennial, fish-bearing stream that flows in a Type A channel, with a gradient of about 16 percent. Channel bed materials are composed of cobbles, gravel and some boulders. About 2 percent of the substrate is composed of fines. Streambanks are stable and don't contribute much sediment (Raleigh 1994).

Logan Creek: Logan Creek is outside of the Wilderness boundary within the Logan Creek Subwatershed. This fourth order stream flows through channel Type "B", with some Type "A" areas. Overall, the stream is moderately steep, with an average gradient of 3.7 percent. Substrate condition was assessed from 1990-1998 (Nelson et al. 1999). Surface fines (21.8 percent) and cobble embeddedness (22.1 percent) in Logan Creek were above desired levels.

Big Creek: The section of Big Creek from the confluence with Logan Creek to the confluence of Smith Creek is in the project area. Upper Big Creek is a fourth order stream that flows through Type A, B, and C channels with gradients ranging from 1 to 7 percent. Dominant and subdominant substrate materials are gravel and rubble, with small amount of fines (3.3 percent).

Issue #5: Water Quality

Sediment

Soils and Road-generated Sediment

Soils formed on the metamorphic rocks in the analysis area have surface textures of loam and sandy loam with varying amounts of coarse fragments and are relatively permeable. For the most part, these soils are stable. Roads in the analysis area are typically rocky, with very little sediment generated, compared to roads within the Idaho batholith (USDA 2001).

Within the Wilderness, the quality of some waters has been altered from natural conditions. Although most of the soil erosion occurring in the Wilderness is natural, there are small areas of gullying, sheet erosion, and soil compaction due to past mining activity; improper location, design, and use of trails; camping; and stock use. Soil movement as a result of fires and the loss of vegetation, and fire suppression activities occurs periodically (USDA 1999).

Sediment travel distances and buffer strip efficiencies vary based on geologic erosion factors, road location, design, and the application of BMPs to control sediment flows. On steep slopes derived of gneiss and schist parent materials in the Nez Perce National Forest in Idaho, Burroughs and King (1989) found that 90 percent of the non-channelized sediment traveled less than 88 feet below outsloped roads, and 90 percent of the channelized sediment from insloped roads traveled 200 feet or less. Belt and others (1992) reported protective strip widths needed to contain 83.5 percent of the number of flows on comparatively stable basalts ranged from 35 to 127 feet, depending on obstructions. Efficiency of the protective strip could be increased to 97.5 percent by adding an additional 60 feet to the buffer widths. In a study based on a model of sediment yields by road lengths and buffer strips, the model showed that road segments between cross drains 10 meters or less in length had no noticeable sediment yield at any slope as long as a 10-meter buffer was in place. In this modeling study, Morfin and others (1996) showed that 80-100 percent of the sediment was trapped on a buffer strip 130 feet wide for any road length or slope in the Idaho climate.

About 50 to 90 percent of excess sediment from forest activities originates on road systems (Elliot et al. 1994). The largest sediment loss occurs in the first two or three years after construction or reconstruction. Sediment loss usually decreases substantially after those initial few years, as the cut and fill slopes stabilize and become revegetated (Burroughs and King 1989, Ketcheson and Megahan 1996).

Aquatic habitat degradation resulting from such processes as pool filling and cobble embeddedness are well documented (Weaver and Fraley 1993, Young et al. 1991). Roads directly affect natural sediment and hydrologic regimes by altering stream flow, sediment loading, sediment transport and deposition, channel morphology, channel stability, substrate composition, stream temperatures, water quality, and riparian conditions in a watershed. Road-derived sediment typically results in an increase in the proportion of fine bedload in streams. Changed timing and size of peak and low flows resulting from roads have implications for over summer and over winter survival of fish eggs. This is particularly important in the analysis area where the hydrologic regime is storm-generated and snowmelt-dominated (USDA 2001).

Soil erosion and sedimentation from roads is controlled by a variety of environmental factors that affect soil particle detachment and movement down slope. Key factors that influence the amount of sediment delivery include slope, soil and climate (Elliot et al. 1999). Soils within the analysis area are derived from predominantly metamorphic rocks, and are more cohesive and less erosive than soils derived from granitic rocks of the Idaho Batholith (USDA FC-RONR Wilderness, Programmatic Management Plan, 1998-revised)

Traffic has been found to be a factor affecting road sediment production (Burroughs et al. 1984, Ried and Dunne 1984, Sullivan and Duncan 1981). Measurements of sediment production from an unsurfaced roadway in border zone batholith material showed that a surface rutted by heavy truck traffic will produce 2.08 times the yield of a smooth surface (Burroughs et al. 1984). Potyondy and others (1991) state that erosion rates from roads increase by a factor of 1.4 for light use (less than 5 vehicles /day) versus heavy use (greater than 5 vehicles/day). Sediment delivery from increased traffic is only qualitatively assessed in this analysis.

Road-related concerns identified during road surveys conducted in 2002 in the project area included downcutting of inslope ditches, rutting of road surfaces, eroding banks at stream crossings, and insufficient drainage. The major concern associated with stream crossings was the need to replace fords with culverts or bridges or armor the crossing (Dixon 2002).

Stream crossings present the opportunity for direct sediment delivery from the exposed banks or from erosion delivered from the adjoining road. From a sediment delivery perspective, stream crossings may be the most sensitive part of a road system. Crossings provide a direct conduit for sediment to reach streams with little or no buffering vegetation, and can cause fish passage barriers (Elliot et al. 1994).

Sediment Delivery Model

The model WEPP:Road is designed to predict runoff and sediment yield specifically from roads (Elliot et al.1999). The WEPP:Road sediment model predicts sediment delivery from a road segment on a yearly basis using average slope, local climate, soil type, cross drain spacing, road width and a vegetative buffer component (Elliot et al. 1999). The model was used to predict and compare project and management-induced sediment delivery between existing conditions (Alternative A) and the action alternatives. For most midslope forest roads, only those road segments and fillslopes near stream crossings have a high potential to contribute eroded material to streams (Burroughs and King 1989). Therefore, only road segments at stream crossings were quantitatively evaluated in the analysis. The primary application of this erosion model is to estimate the runoff and amount of sediment entering a stream system from a given road segment. The model is best used to compare different management alternatives rather than to predict absolute quantities of sediment delivery (Elliot et al.1999).

Preliminary runs were performed using the generated local climate to determine how many years of run were necessary to ensure a stable average erosion value for road segments near streams. For the Golden Hand Mine site and the roads outside of the Wilderness, 30 years were adequate and these values were used to establish the existing condition against which the proposed plan and agency-modified alternatives were compared.

Stream crossing condition was inventoried during wetland and other surveys conducted in 2002 (Project Record). Based on these observations, the slope and length of road contributing runoff to the stream at each crossing was determined. A detailed description of the WEPP:Road model including input parameters and assumptions for each run (e.g., contributing road length, slope, width of travelway, cross drains, and number of culverts) is provided in Appendix D and in the Soil and Water Specialist Report in the Project Record.

Sediment modeling results for FR 371 and 373 outside the Wilderness show a total of 18.4 tons/year of sediment is delivered to streams under existing conditions (Table 3-5). Sediment delivery from abandoned roadbeds within the Wilderness was estimated to be essentially zero. Sediment from abandoned roadbeds was not modeled using WEPP:Road. Instead the natural erosion rate (Arnold 1988) for the landtype where the roadbeds occur (Landtype 109e at 15 tons/sq mi/yr) was apportioned to the actual area of roads contributing runoff to streams. Based on this, approximately 0.0075 tons (15 pounds) per year was estimated to be generated from the abandoned roadbeds on the claims in the Wilderness.

Table 3-5. Existing Sediment Delivery to Streams from Roads in the Golden Hand Mine Project Area.

	*Alternative A**
Access roads outside of Wilderness (FR 371 and 373) *(tons/year)*	18.4
Logan Creek road outside Wilderness (FR 343) *(tons/year)*	0.5
Mine roads and trenches in Wilderness *(tons/year)*	0.0075

* Natural sediment yield from landtype 109e is 15-tons/sq mi/year. Area of roads contributing sediment to streams was estimated at 0.0005 sq mi.

Metal Contamination

Geochemistry & Water Chemistry

Metals are the primary contaminants of concern when dealing with potential mining impacts to water and fishery resources. Ore at the mine site occurs along joints and shear planes in granite and schistose rocks of the Yellowjacket formation (Shenon and Ross 1936). Sulfides including disseminated pyrite and chalcopyrite are associated with the ore and can be found in the historic mine waste dumps. Based on field observations by project hydrologists and geologists (Project Record), sulfides exposed at the surface show considerable oxidation. Sulfides have the potential to generate acid and liberate metals to the environment when exposed. The risk of acid rock drainage and release of metals is primarily a function of the sulfide content of the disturbed rock. The actual sulfide content of the vein and wall rock in the proposed disturbance area is unknown.

Geochemical testing of the rock was conducted in 2002 to determine the acid generating potential (Soil and Water Specialist Report, Project Record). Two waste rock samples were collected from the waste rock dump and analyzed for acid generating potential (AP), acid neutralizing potential (NP), and percent sulfide sulfur using the Acid-Base accounting (ABA) screening procedure. A description of the ABA is provided in the Soil and Water Specialist Report.

Water quality data were generated from samples of an adit discharge at the mine site and from Coin Creek collected in October 2002. The purpose of the water quality data collection was to determine the impacts of past mining on water quality and also to assess the potential for rock at the Golden Hand Mine to release metals to the aquatic environment. A small volume of water (<5 gpm) drains from an adit at the mine site and infiltrates into the waste rock dump. The water sample of the adit discharge showed total metal concentrations below the detection limits except for lead (1 µg/L). The adit lead concentration is below the EPA freshwater chronic criterion of 2.5 µg/L (expressed as dissolved). Water from the adit does not flow into any live stream and there is no aquatic life in the vicinity of the adit or waste dump. A sample was also taken from Coin Creek below the historic mining disturbance and all metals were below the detection limits. No evidence of acidic drainage has been observed from the historic adits or open cuts. Data from the water quality analyses (performed by SVL Analytical Inc., Kellogg, Idaho) is located in the Project Record.

Little water quality monitoring has occurred in the Wilderness. Chemical analyses of water collected within the Wilderness show most to be soft, low metal content, high quality waters (USDA 1999). An important feature of streams throughout the analysis area is the cold temperature. Water temperatures measured in August and September ranged from 7 to 12 degrees Celsius in the lower reaches of Beaver and Smith Creeks to 4 to 7 degrees Celsius in Coin Creek and North Fork Smith Creek (Raleigh 1994). The cold temperatures facilitate spawning and propagation of salmonid species of fish.

Issue #6: Wetlands and Riparian Zones

Riparian zones and wetlands that may be affected by the proposed activities in the analysis area were field delineated on the basis of observed vegetation, hydrology, and geomorphic indicators using the Region 4 Integrated Riparian Evaluation Guide (Golden Hand Wetland Inventory 2002, Project Record). Delineation of these areas differs from the method used to identify RHCAs (described above and in the Fisheries Resource section). RHCAs often extend beyond the observed riparian vegetation and saturated soils to include upland areas that provide large woody debris, shade, and buffer areas to the stream.

The principal types of wetlands in the project area are emergent and scrub-shrub wetlands. The riparian zone includes the stream channel and the adjacent area where soils are often saturated, and inundation may occur periodically. Riparian zones associated with the smaller streams are limited to narrow bands paralleling the channel banks. Road maintenance and construction and trenching associated with mining are the primary activities that may affect wetlands and riparian zones in the analysis area.

Wetland delineation surveys identified 20 riparian areas on the roads from the Big Creek Trailhead to Pueblo Summit (Figures 3-9, 3-10). These sites included: six wetland sites, eight perennial stream crossings (including five ford areas), one intermittent stream crossing, and five seep/spring areas. The total length of wetlands affected on these roads is 1,010 feet. Wetlands were also delineated along FR 343 and the portion of FR 371 along Big Creek, but because no road construction activities are planned along these sections they will not be addressed further in this analysis.

Within and adjacent to the claims area, surveys identified four locations where abandoned roadbeds cross perennial streams, and two locations where intermittent streams are crossed (Golden Hand Wetland Inventory 2002, Project Record). Stream channels have widened at crossings but over time with no use the channels have stabilized and revegetated.

The widths of the riparian zones vary by channel type. Incised channel segments and steep valley-wall tributaries like Coin Creek and North Fork Smith Creek have very narrow riparian zones. Most stream tributaries to Smith Creek have natural riparian widths of 15 to 50 feet. These zones are probably influenced by ground water inflows and seepage as well as by inundation during high flows. In some areas, the riparian zone may widen to as much as 70 feet. Roads have caused stream crossings to widen beyond their natural channels.

Environmental Effects

Issue #5: Water Quality

Indicators

- Estimated change in delivered sediment
- Risk of metal contamination

Sediment

WEPP:Road was used to predict and compare the amount of sediment contributed by roads to streams under the various alternatives. Only road segments at stream crossings were evaluated in the model because research has shown that on many midslope forest roads (such as many of those in the project area) only those road segments and fillslopes near stream crossings have a high potential to contribute eroded material to streams (Burroughs and King 1989). The model is best used to compare different management alternatives rather than to predict absolute quantities of sediment production (Elliot et al.1999). Short-term spikes in erosion rates generally occur from construction activities within the first two to three years after disturbance (Morfin et al.1996), however, this is not considered in the WEPP:Road model.

Changes in sediment delivery predicted by WEPP:Road for each alternative are displayed in Table 3-6. Under existing conditions, the access roads outside the Wilderness contribute approximately 18.4 tons/year of sediment to streams. Based on the model, sediment contribution from roads to streams outside of the Wilderness would be improved for Alternatives C and D. Cross drains have the greatest impact on sediment reduction to streams. Estimated sediment delivery would drop from 18.4 tons per year to 1.5 tons per year. Alternative B does not reduce sediment because the roads would be wider and fewer road improvements would be implemented. Overall, Alternative D would result in the least impact to water quality from sediment because it results in the least detrimental impact to water quality inside the Wilderness.

Table 3-6. Projected Change in Sediment Delivery to Streams under the Different Alternatives for the Golden Hand Mine Project.

	*Alternative A**	*Alternative B*	*Alternative C*	*Alternative. D*
Access roads outside Wilderness (FR 371 and 373) ***(tons/year)***	18.4	19.6	1.5	1.5
Logan Creek road outside Wilderness (FR 343) ***(tons/year)***	0.5	0.6	0.1	0.1
Mine roads and trenches in Wilderness ***(tons/year)***	0.0075	5.1	1.0	0.0075

* Natural sediment yield from landtype 109e is 15 tons/sq mi/year. Area of roads contributing sediment to streams was estimated at 0.0005 sq mi.

Alternative A (No Action)

Under the No Action alternative, sediment delivery from roads would remain stable or any existing trends in conditions would continue. No improvements to existing roads would occur beyond standard maintenance. Existing water quality trends would continue. The current number and condition of stream crossings (nine fords and one culvert) would remain the same. Existing stream crossings would likely continue to deliver sediment to streams, which could be impairing, or may in the future impair, beneficial uses.

The total existing sediment delivery to streams in the analysis area outside of the Wilderness in the Smith Creek and North Fork Smith Creek drainages is estimated at 18.4 tons/year (Table 3-6). The majority of the sediment delivery is from existing road crossings. Essentially no sediment (estimated at approximately 0.0075 tons per year) is generated from abandoned roadbeds at the mine site. Little sediment is currently generated from the mine area because these roads are closed to traffic and are largely revegetated. The access roads in the Smith Creek drainage generate sediment from vehicle use and crossing of streams. The estimated existing traffic use on FR 373 is 70 round trips per year (Project Record). Additional sediment is likely generated from other mining disturbances and from natural sediment yield from undisturbed areas in the watersheds.

Alternative B

Outside the Wilderness, the WEPP:Road model predicts a slight increase in sediment delivery from roads to streams under Alternative B. Sediment delivery would increase to 19.1 tons per year based on installation of two effective cross drains and widening of the roads up to two feet. Under Alternative B, AIMM did not commit to a specific type or amount of cross drain installation, but based on correspondence with AIMM, the ID Team estimated two effective cross drains and no culverts would be installed.

Inside the Wilderness, construction of new roads in the mine area would cause short-term and long-term increases in sediment production under Alternative B. Projected sediment delivery to streams would increase from 0.0075 tons per year to 5.1 tons per year due to trenching, building of new roads, movement of heavy equipment, steep topography, lack of erosion control measures, and an inadequate reclamation plan. An adequate plan would provide specifications for recontouring and revegetating all roads and disturbances associated with the mining operation resulting in a return to baseline sediment yield conditions after reclamation work is completed. There are no streams near Forest Service Trail #013, therefore the WEPP:Road model does not predict any sediment delivery from this section of access route in the Wilderness.

In addition to the sediment projected by WEPP:Road, other activities would likely add to the overall sediment impacts. Actions such as the increased vehicle use on roads, driving vehicles across streams, building drill pads, soil compaction from vehicle parking areas, and the disturbances from the onsite camp would also generate some sediment. Construction of trenches, particularly trench construction parallel to the slope, could result in channelized sediment delivery. Road maintenance activities would remove unspecified amounts of fill material from side slopes.

Alternative B does not conform to the State of Idaho Antidegradation Policy because less degrading alternatives (Alternatives C and D) are available. Streams in the analysis area are "Tier 2 Waters" and must be maintained and protected unless an analysis and public review process concludes that the degradation is necessary for social and economic reasons, and that other less

degrading alternatives are not available (IDAPA 58.01.02(051)). This alternative would have the highest net road miles and the highest number of stream crossings with fewer mitigation measures to minimize sediment contributions to area streams. Impairment of beneficial uses in Coin Creek, Beaver Creek and Smith Creek may occur under Alternative B.

Alternative C

Outside the Wilderness, Alternative C would require installation of 6 new culverts, 20 new cross drains and a log stringer bridge on the access roads. These required erosion control measures would substantially reduce sediment delivery compared to existing conditions. WEPP:Road predicts sediment delivery would decrease from 18.4 tons per year to 1.5 tons per year (Table 3-6). Some short-term increases in stream turbidity could occur from improvement activities on FR 371 and 373, however implementation of Best Management Practices (BMPs) (see Chapter 2 and Appendix D) would minimize these effects. These actions would provide a long-term benefit to water quality and beneficial uses by reducing sediment delivery to streams.

Inside the Wilderness, projected sediment delivery would increase to 1.0 tons/year for Alternative C. The model predicts less sediment delivery to streams for Alternative C compared to Alternative B (5.1 tons per year) due to required erosion control measures on the mine roads, fewer mine roads, and no trenching. In addition, the reclamation plan requires complete recontouring of project related drill roads. Several years after the project is completed and all disturbed areas have been recontoured and revegetated, the sediment load is expected to return to baseline levels (0.0075 tons per year).

Alternative D

Outside the Wilderness, Alternative D would require the same erosion control measures (i.e., culverts, cross drains, and a bridge) as Alternative C. WEPP:Road predicts sediment delivery would decrease from 18.4 tons per year to 1.5 tons per year (Table 3-6). If maintained, the erosion control measures built into the access road under this alternative would provide a long-term benefit to water quality in the watershed. Some short-term increases in stream turbidity could occur from improvement activities on FR 371 and 373, however implementation of BMPs (see Chapter 2 and Appendix D) would minimize these effects.

Inside the Wilderness, no change in sediment delivery to the Coin Creek drainage would occur because no road construction or trenching would be allowed. Alternative D is the least degrading alternative and therefore complies with the Clean Water Act and requirements of the state of Idaho Antidegradation Policy.

Metal Contaminants

Alternative A – No Action

Under Alternative A, a small volume of water (<5 gpm) would continue to discharge from an adit on the mining claims. A water sample taken from the adit showed total metal concentrations below the detection limits except for lead (1 ug/L). The adit lead concentration is below the EPA freshwater chronic criterion of 2.5 ug/L (expressed as dissolved). Water from the adit does not flow into any live stream. The historic adits in the area of the claims have allowed oxygen and water to react with the ore and wall rock, and thus, water discharging from the adit reflects the natural weathering processes occurring underground. The adit water quality does not indicate

acid generation or release of a significant metals load from the underground workings. No evidence of acidic drainage has been observed from the historic adits, open cuts, or waste rock dumps. A water sample was also taken from Coin Creek below the historic mining disturbance and all metals were below the detection limits. No impacts to water quality from fuel storage and spills or from drilling fluids would occur since no drilling or underground development would be allowed.

Alternative B

Additional water quality concerns for the project are the interrelated issues of pH changes and metal contamination associated with discharges created by underground mining and exploration drilling. Mining and drilling activities can expose fresh rock surfaces to oxidation and cause release of metals and acidification of waters. The vein and host rock at the Golden Hand Mine contain sulfides and base metal mineralization (Shenon and Ross 1936). Sulfides, including disseminated pyrite and chalcopyrite, are associated with the ore and can be found in the historic mine waste dumps. The risk of acid rock drainage and release of metals is a function of the sulfide content of the disturbed rock. Sulfides have the potential to generate acid and liberate metals to the environment.

Based on the adit water quality, there is not presently an acid drainage or metal contamination problem at the mine site. However, material with acid generating potential, or high base metal or sulfide content, could be encountered under this proposal especially through underground development. Once acid rock drainage is generated at a mine it is nearly impossible to stop. Mitigation measures designed to limit acid rock drainage are few and generally ineffective. Monitoring of the discharge quality and halting and revaluating the project if acid drainage is detected is the most common method of reducing the magnitude of the problem.

Geochemical testing determined the acid generating potential of the waste rock. Two waste rock samples were collected from the waste rock dump and analyzed for acid generating potential (AP), acid neutralizing potential (NP), and percent sulfide sulfur. The NP/AP ratio for one sample was 3.5, and little sulfide sulfur content, suggesting that the rock would not generate acid (Hutchison and Ellison 1992). Another rock sample from the waste dump showed an NP/AP ratio of 1.0 and sulfide sulfur content of one percent, indicating that the rock may generate acid (Hutchison and Ellison 1992).

While no evidence of acidic drainage has been observed from the historic adits or open cuts, a water quality monitoring program would provide early warning of potential acid drainage. Alternative B proposes no further geochemical testing or water monitoring. If development of the adit or exploration drilling causes a discharge of water with flow large enough to impact nearby perennial surface water, the operator would be required to seek a National Pollution Discharge Elimination System (NPDES) permit through EPA and the Idaho DEQ.

Alternative C

The effects of metal contaminants from Alternative C could be the samé as described under Alternative B, but Alternative C would require a water quality-monitoring program to test for acid drainage and/or metals, in project-generated or modified discharges. This testing would provide an early warning of a developing water contamination problem. Further testing and monitoring of acid generating potential is warranted based on ABA analyses and is described in the monitoring plan in Appendix F.

Alternative D

Effects would be the same as Alternative C. Exploration drilling and underground development in the adit would be allowed and a water quality-monitoring program would be required.

Issue #6: Wetlands and Riparian Zones

Alternative A

Under Alternative A, the 20 wetland sites totaling 1,012 linear feet along the existing roads and the wetlands and riparian zones on the claims would remain largely unchanged. Continued use of the fords along FR 371 and 373 would be expected to expand the stream channels beyond already widened conditions (Crawford, pers. comm. 2002).

Alternative B

Activities under Alternative B have the greatest potential to adversely affect wetlands and riparian zones. The landscape includes small wetlands (less than one acre in size) and narrow floodplains associated with seeps, springs, and streams. A larger floodplain exists along Smith Creek.

Outside the Wilderness, the road widening expected to occur under Alternative B would impact approximately 0.05 acres of wetlands and riparian zones. Inside the Wilderness, road construction proposed under Alternative B would include 50 to 500 foots segments of road within riparian zones and wetlands at the mine site. Approximately 0.06 acres of wetlands and riparian zone within RHCAs would be impacted due to road building. Activities related to filling of wetlands would require a 404 permit from COE and a 401 certification from the Idaho DEQ.

Alternative C

Alternative C would provide greater protection of water quality than Alternative B by reducing disturbance within RHCAs, thus reducing the amount of wetlands and riparian zones affected by the proposed mining activities. Outside the Wilderness, Alternative C would limit disturbance of wetlands and riparian zones on the access roads to activities necessary to install road improvements (such as culverts). Inside the Wilderness, road construction activities would disturb 0.03 acres of wetlands and riparian zones under Alternative C versus 0.06 acres under Alternative B. Activities related to filling of wetlands would require a 404 permit from COE and a 401 certification from the Idaho DEQ.

Outside the Wilderness, Alternative C proposes to treat and/or eliminate identified road and stream crossing concerns on the access roads (FR 371 and 373). Roadwork would reduce erosion and sedimentation in the Smith Creek drainage through redesign or additional mitigation, such as the application of roadbed gravel, addition of rolling dips and/or cross drains, and culvert and bridge installation. These measures have been shown to be effective at reducing sediment yield from forest roads (Gucinski et al. 2001). In-channel treatments would include the following activities based on individual crossing conditions: removing fill from the channel, use of a stabilizing geogrid in the channel bottom, filling the geogrid with rocks, re-sloping streambanks to natural slope profiles existing above and below the crossing, stabilizing disturbed areas with slash or straw mulch, seeding, and installation erosion control-matting on streambanks. Restoring

natural channel pathways reduces risks of blockage in flood events and can eliminate fish passage barriers. Fish passage would improve through installation of proper size culverts at accommodating gradients.

In Alternative C, mine site impacts are reduced by the elimination of 0.6 miles of road, including five stream crossings, from the plan. No trenching would occur and ground disturbance from drill sites would be minimized through the use of mitigation measures (see Appendix D). Road construction to access drill sites would have the greatest impact on sediment delivery to streams, but the use of BMPs would minimize these effects (Appendix D).

Alternative D

Alternative D proposes greater protection of water quality and fishery resources than all other alternatives by reducing the amount of wetlands and riparian zones affected by the proposed mining activities, and by improving the condition of roads outside the Wilderness. Outside the Wilderness, Alternative D would limit disturbance of wetlands and riparian zones on the access roads to activities necessary to install road improvements (such as culverts). Alternative D would cause no disturbance of wetlands and riparian zones in the Wilderness.

This alternative treats and/or eliminates all identified road and stream-crossing concerns associated with Alternative B. Alternative D protects watershed conditions in the mine area by eliminating all road building and trenching. With additional mitigation measures, drilling would be allowed up to 50 feet from streams. Like Alternative C, these reductions in disturbance within riparian areas would reduce sediment supply, maintain hydrologic flow paths, and retain riparian vegetation. Exclusion of most mine activities within RHCAs conforms to PACFISH requirements and incorporates BMPs for protection of beneficial uses of water.

Summary

Within the Wilderness, Alternative B would result in the greatest amount of sediment delivery due to trenching and building of new roads to access drill sites. Modifications to the proposed plan applied under Alternative C, such as limiting road construction and trenching, would reduce some of the sediment delivery to streams. Under Alternative D, sediment would not increase due to the elimination of roads and trenches from the plan. Some short-term increases in sedimentation from construction of drill pads could also occur under any action alternative, however under Alternatives C and D use of BMPs would minimize these effects.

Under existing conditions, the access roads outside the Wilderness contribute approximately 18.4 tons/year of sediment to streams. Based on the WEPP:Road model, sediment contribution from roads to streams outside of the Wilderness would be improved for Alternatives C and D. Cross drains have the greatest impact on sediment reduction to streams. Estimated sediment delivery would drop from 18.4 tons per year to 1.5 tons per year. Alternative B does not reduce sediment because the roads would be wider and fewer road improvements would be implemented.

Based on the adit water quality analysis, there is not presently an acid drainage or metal contamination problem at the mine site and this situation would not change under Alternative A. However, material with acid generating potential, or high base metal or sulfide content, could be encountered under this proposal especially through underground development. Under Alternatives C and D, the proposed monitoring of adit discharge quality would provide early warning of a developing water quality problem.

Activities under Alternative B have the greatest potential to harm wetlands and riparian areas. Widening of the access roads outside the Wilderness to 12 feet would require cutting of trees in RHCAs that could provide shading and large woody debris to streams. Road widening outside the Wilderness would also impact approximately 0.05 acres of wetlands and riparian zone within RHCAs. Within RHCAs in the Wilderness, 0.06 acres of wetland/riparian zone would be impacted due to road building. Alternative C would limit any additional disturbance of wetlands and riparian zones outside of the Wilderness, but would allow 0.03 acres of wetland and riparian disturbance within RHCAs on the mine site. Alternative D would result in no disturbance of wetlands or riparian areas or RHCAs.

Summary

In review of all the water resource, wetland, and riparian indicators, Alternative D would provide the least detrimental impacts compared to Alternative A by minimizing roads and disturbance within riparian areas and addressing the greatest number of identified concerns related to roads, stream crossings and water quality and quantity. Alternative C would rate lower than Alternative D mainly because it allows some road building in the mine area. Alternative B degrades water quality in the mine area and downstream and also does not provide any long-term improvement in watershed health outside the Wilderness, as do Alternatives C and D. Water quality issues in the mine area include sediment from roads and other disturbances, and possible fuel spills and acid mine drainage that could violate water quality standards. Alternative A would continue existing sediment production from roads but water quality conditions in the Wilderness would not change.

Alternative B does not conform to the State of Idaho Antidegradation Policy because less degrading alternatives (Alternatives C and D) are available. Streams in the analysis area are "Tier 2 Waters" and must be maintained and protected unless an analysis and public review process concludes that the degradation is necessary for social and economic reasons, and that other less degrading alternatives are not available (IDAPA 58.01.02(051)). This alternative would have the highest net road miles and the highest number of stream crossings with fewer mitigation measures to minimize sediment contributions to area streams. Impairment of beneficial uses in Coin Creek, Beaver Creek and Smith Creek may occur under Alternative B.

Cumulative Effects

The primary ongoing and future actions that could affect water quality and wetlands in the cumulative effects analysis area include road maintenance and construction, work on existing mining claims, recreation primarily related to outfitters and guides, water diversions, and private land use (Appendix A). The predicted increases in sediment and effects to water quality of Alternative B could result in negative cumulative effects to water quality and wetlands when coupled with some of the other activities that are ongoing or are predicted to occur in the analysis area. Negative effects predicted under Alternative C would also be cumulative with these other activities, but to a lesser degree with fewer negative impacts.

Federal Actions

Inside the Wilderness, other historic mining disturbances exist in the Golden Hand Mine areas that are not part of the mine plan. Abandoned roads, waste rock piles, adits, and the historic mill and bunkhouse area may contribute some sediment to Coin Creek. Because these disturbances have been revegetated, sediment yield is probably minor.

The descriptions of development on the Golden Hand No's. 3 and 4 lode mining claims under Alternative B and C are reasonably foreseeable extensions of Alternative D if sufficient geologic information is found. Additional trenches, drill sites and associated roads and facilities could be proposed for Golden Hand operation. These activities would increase water quality concerns in the Coin Creek and Beaver Creek watersheds, as displayed in this analysis.

Assessment work is reasonably foreseeable on the Golden Hand No's. 1 and 2 lode-mining claims due to a court order that directed the Forest Service to work with AIMM to determine the extent of work AIMM would be permitted to conduct on claim No's. 1 and 2 to prepare for a new validity examination. AIMM has submitted a proposal that includes road construction, trenching, and use of a backhoe to reopen a closed portal. Activities on mining claims No's. 1 and 2 would likely increase sediment yield, may impact wetlands, and could increase the risk of metal contamination in the Coin Creek drainage. These impacts may be cumulative to the effects predicted in this analysis.

Three additional mineral operations exist in the analysis area with the potential for sediment production, fuel and reagent spillage.

In addition to the Smith Creek and Pueblo Summit access roads analyzed in this DEIS, several miles of roads along the middle and west forks of Smith Creek also contribute sediment to the Smith Creek watershed. Most are native-surfaced roads, occasionally maintained, and receive use by recreationists, hunters, and the general public. Some roads have unstable cut-and-fill slopes, and uncontrolled road surface drainage. Under Alternative B, cumulative sediment delivery in the Smith Creek Watershed would increase. Under Alternatives C and D, cumulative sediment delivery would decrease due to extensive road improvement activities.

Special use permits have been issued by the Forest Service for water diversions and hydroelectric operations (Appendix A). Required mitigation measures and proposed modifications would reduce impacts to water quality and would not be cumulative to effects to water quality analyzed in this DEIS.

Recreational use by outfitters and the general public of trailheads and trails, campgrounds, dispersed camping areas, and recreation sites have the potential to increase sediment yield by disturbing and compacting soils in high use areas. Within the Wilderness, sediment from the trail along lower Beaver Creek may add to that produced from the mine under Alternatives B, C, and D.

Certain ongoing and predicted activities are expected to offset the predicted negative effects of the alternatives, including improved road maintenance, termination of fording in Big Creek, camping restrictions in Smith Creek riparian areas, and screening and other mitigations associated with water diversions. Under Alternatives C and D, road maintenance, in particular, would have a positive, beneficial effect, as roads are maintained to maximize efficiency in dispersion of water through blading, drainage control, and spot graveling.

Non-Federal Actions

Water quality impacts may also result from non-federal actions such as road construction and maintenance by private landowners on private lands and road maintenance by Valley County on county roads. Many roads are adjacent to or ford streams and the work may not include measures to minimize sedimentation into streams. Subdivision and residential development of private land

must meet county regulations for sanitation but can occur near to streams. Small-scale harvest of trees off private land for personal use could cause sedimentation to streams. Private land owners may not follow restrictions on buffers or weather restrictions when applying herbicides near streams. Weed control by private landowners is generally localized and limited.

Irreversible and Irretrievable Commitments

New roads are considered irretrievable commitments of soil productivity and hydrologic function until these areas recover naturally, or are restored to a productive state and function. Constructed stream crossings would also be an irretrievable commitment of the riparian resource for the life of the crossings. Irreversible commitments of resources related to roads are not expected under the agency-modified alternatives because under Alternative C, all new roads on the claims would be fully reclaimed with hydrologic function restores and under Alternative D no new roads would be built.

Forest Plan Consistency

Forest Plan Standards and Guidelines would be met by the agency modified action Alternative D. Water quality would meet or exceed Idaho Water Quality Standards for the protection of beneficial uses (USDA 1988, pp. IV-71 to 76). Riparian areas would be managed to maintain or improve riparian-dependent resources. Monitoring activities would be conducted on select sites to evaluate the implementation and effectiveness of management practices. Habitat protection and restoration strategies have been incorporated into Alternatives C and D to protect and improve aquatic health by protecting Riparian Habitat Conservation Areas (RHCAs). Roads no longer required for mineral activities would be obliterate and revegetated in Alternative C. Agency modified Alternatives C and D best meet Forest Plan direction for Soil and Water resources. Project related road improvements in the agency-modified alternatives would improve current water quality, watershed, and riparian conditions, outside the Wilderness leading to an improvement to the designated beneficial uses of water.

Specialist Report

This DEIS hereby incorporates by reference the Soil and Water Resources Specialist Report in the Project Record (40 CFR 1502.21). The Soil and Water Resources Specialist Report is located in Section 5(6) of the Project Record and contains the detailed data, methodologies, analyses, conclusions, maps, references, and technical documentation that the hydrologist relied upon to reach the conclusions presented in this DEIS.

Fisheries Resource

Scope of the Analysis

Issue #7: The effects of the proposed activities on fish populations and habitat of concern (i.e., federally listed species; Payette National Forest sensitive species; and Management Indicator Species).

Indicators

Effects to Riparian Management Objectives (RMOs) as tracked by the following relevant fisheries habitat indicators:

- Large Woody Debris (LWD)
- Fine Sediment Levels
- Stream Flow
- Chemical Contamination
- Road Density and Location

Background

The proposed mine development occurs in the Middle Fork Salmon River (MFSR) Watershed (4th level USGS hydrologic unit). The MFSR Watershed provides habitat for three threatened fish species (chinook salmon, steelhead, and bull trout) and one Region 4, Payette National Forest sensitive fish species (westslope cutthroat trout). The watershed also provides habitat for redband/rainbow trout, a Payette National Forest Management Indicator Species (MIS). Distinguishing between redband/rainbow trout and steelhead is difficult and both are assumed the same unless a fish barrier is present. Redband/rainbow trout are resident, fresh water fish; steelhead are anadromous, migrating to and from the sea. Reference to "steelhead" throughout this document will include redband/rainbow trout.

The Golden Hand mining claims are adjacent to Coin Creek, a tributary to Beaver Creek (Figure 2-1, Chapter 2). Coin Creek is fish bearing in its lower reaches. All of the above fish species of concern occur in Beaver Creek. Access roads to the mine are located along portions of Logan Creek, Big Creek, Smith Creek, and North Fork Smith Creek. Fish species of concern are also located in these streams.

Possible effects to fish and fish habitat in the analysis area from the proposed plan include changes in sediment levels, the distribution, amount, and potential recruitment of large woody debris (LWD), alteration of water quantity (flow), and degradation of water quality (from sedimentation, human waste, fuels exposure, and mineral contaminants).

Major Comments: Comments received from the public, agencies, organizations, and Tribal Governments expressed concerns with activities occurring in Riparian Habitat Conservation Areas (RHCAs) and the subsequent impacts on listed fish species. Other comments focused on the potential impacts to anadromous fish habitat and treaty fishing rights. Additional information on public comments is available in Chapter 4.

Management Direction

Payette National Forest Land Management Plan

The Forest Plan states that the Desired Future Condition for fish habitat in the analysis area is to improve fish habitat capability in drainages with salmon and steelhead, limit sediment production, invest in fish habitat and watershed improvement and erosion control on roads. The Forest Plan also states that habitat for resident fish: redband/rainbow trout, westslope cutthroat trout, and bull trout, is expected to be maintained in its present condition (USDA 1988, as amended, p. IV-41).

The Forest Plan identified redband/rainbow trout, westslope cutthroat trout, bull trout, steelhead, and chinook salmon as Management Indicator Species (MIS) to assess the impacts of management activities on fish populations and habitat in the FC-RONR Wilderness and Big Creek and its tributaries (USDA 1988, as amended, p. IV-40).

The Forest Plan has been amended to include goals, objectives, standards, and guidelines for protection of anadromous and inland fisheries as defined in the *Interim Strategies for Managing Anadromous Fish-producing Watersheds in Eastern Oregon and Washington, Idaho, and Portions of California* (known as "PACFISH") (USDA and USDI 1995) and the *Inland Native Fish Strategy* (known as "INFISH") (USDA 1995c). PACFISH direction applies to the project area.

PACFISH identified Riparian Management Objectives (RMO) for the protection of fish populations and fish habitat. PACFISH defines RMOs as "quantifiable measures of stream and streamside conditions that define good anadromous fish habitat, and serve as indicators against which attainment, or progress toward attainment, of the goals will be measured." These RMOS apply to key fisheries habitat features, also known as "indicators", such as temperature and large woody debris.

PACFISH also identifies Riparian Habitat Conservation Areas (RHCAs) defined as "Portions of watersheds where riparian-dependent resources receive primary emphasis, and management activities are subject to specific standards and guidelines." Interim RHCA widths are defined as:

Category 1: Fish-bearing streams: Interim RHCAs consist of the stream and the area on either side of the stream extending from the edges of the active stream channel to the top of the inner gorge, or to the outer edges of the 100-year floodplain, or to the outer edges of riparian vegetation, or to a distance equal to the height of two site-potential trees, or 300-feet slope distance (600 feet, including both sides of the stream channel), whichever is greatest.

Category 2: Permanently flowing non-fish-bearing streams: Interim RHCAs consist of the stream and the area on either side of the stream extending from the edges of the active stream channel to the top of the inner gorge, or to the outer edges of the 100-year flood plain, or to the outer edges of riparian vegetation, or to a distance equal to the height of one-site potential tree, or 150 feet slope distance (300 feet, including both sides of the stream channel), whichever is greatest.

Category 3: Ponds, lakes, reservoirs, and wetlands greater than 1 acre: Interim RHCAs consist of the body of water or wetland and the area to the outer edges of the riparian vegetation, or to the extent of the seasonally saturated soil, or to the extent of moderately and highly unstable areas, or to a distance equal to the height of one site-potential tree, or 150-feet

slope distance from the outer edge of the maximum pool elevation of constructed ponds and reservoirs or from the edge of the wetland, pond or lake, whichever is greatest.

Category 4: Seasonally flowing or Intermittent streams, wetlands less than 1 acre, landslides, and landslide-prone areas: At a minimum the interim RHCAs must include: the extent of landslides and landslide-prone areas; the intermittent stream channel and the area to the top of the inner gorge; the intermittent stream channel or wetland and the area to the outer edges of the riparian vegetation; and for Priority Watersheds, the area from the edges of the stream channel, wetland, landslide, or landslide-prone area to a distance equal to the height of one site-potential tree, or 100-feet slope distance.

Figure 3-9 (Soil and Water Resources section) and Figures 3-2 through 3-4 (Minerals and Geology section) display RHCA buffers that apply in the project area and claims area, respectively. For example, segments of perennial streams (Coin Creek and an unnamed tributary) adjacent to and within the Golden Hand Mine claims Nos. 3 and 4 are considered to be non-fish bearing (Raleigh 1994, PNF fish surveys Project Record). In the mining claim area, one-site potential tree height is about 100 feet (Christianson, pers. comm. 2002) and there is essentially no floodplain, so the appropriate RHCA buffer width is 150 feet slope distance.

PACFISH direction for mineral management is described below and further analyzed in the Minerals and Geology section.

MM 1 - Avoid adverse effects to listed species and designated critical habitat from mineral operations. If the Notice of Intent indicates a mineral operation would be located in a Riparian Habitat Conservation Area (RHCA), or could affect attainment of Riparian Management Objectives (RMOs), or adversely affect listed anadromous/inland native fish, require a reclamation plan, approved Plan of Operations (or other such governing document), and reclamation bond. For effects that cannot be avoided, such plans and bonds must address the costs of removing facilities, equipment, and minerals; recontouring disturbed areas to near pre-mining topography; isolating and neutralizing or removing toxic materials; salvage and replacement of topsoil; and seedbed preparation and revegetation to attain RMOs and avoid adverse effects on listed anadromous and inland native species. Ensure Reclamation Plans contain measurable attainment and bond release criteria for each reclamation activity.

MM 2 - Locate structures, support facilities, and roads outside RHCAs. Where no alternative to sitting facilities in RHCAs exists, locate and construct the facilities in ways that avoid impacts to RHCAs and streams and adverse effects on listed anadromous/ inland native fish. Where no alternative to road construction exists, keep roads to minimum necessary for the approved mineral activity. Close, obliterate, and revegetate roads no longer required for mineral or land management activities.

MM 3 - Prohibit solid and sanitary waste facilities in RHCAs.

MM-5 - Permit sand and gravel mining and extraction within Riparian Habitat Conservation Areas only if no alternatives exist

MM 6 - Develop inspection, monitoring, and reporting requirements for mineral activities. Evaluate and apply the results of inspection and monitoring to modify mineral plans, leases, or permits as needed to eliminate impacts that prevent attainment of RMOs and avoid adverse effects on listed fish.

Biological Opinions on the Forest Plan

The Biological Opinion (BO) written for Forest Plans on the Boise, Challis, Nez Perce, Payette, Salmon, Sawtooth, Umatilla, and Wallowa-Whitman National Forests states that, for high priority watersheds concerning mining, a watershed analysis is required prior to approving plans of operation for "likely to adversely affect" actions (NMFS 1995). Due to the time constraints of the Court mandated direction (see Chapter 1), the Forest Service will not be able to conduct a watershed analysis and a selected action may not meet the direction of the 1995 Biological Opinion. The BO for the "Effects of the Management Activities on the Payette National Forest on Steelhead" states that federal actions in the analysis area are subject to the following mitigation measures:

- Build new roads only to replace existing roads in RHCAs, or directly repair human-caused damage to steelhead habitat in streams.
- Do not widen roads by increasing cut and fill slope areas in order to accommodate more traffic and/or larger vehicles than can presently use the road.
- Do not open closed and revegetated roads for management purposes unless necessary to repair human-caused damage to steelhead habitat.
- Do not harvest in RHCAs

These mitigation measures are intended to provide risk avoidance until such time as better scientific information is available (NMFS 1998).

The BO for the "Effects to Bull Trout from Continued Implementation of Land and Resource Management Plans and Resource Management Plans as Amended by the Interim Strategy for Managing Fish-producing Watersheds in Eastern Oregon and Washington, Idaho, Western Montana, and Portions of Nevada (INFISH), and the Interim Strategy for Managing Anadromous Fish-producing Watersheds in Eastern Oregon and Washington, Idaho, and Portions of California (PACFISH)" (USFWS 1998) also outlines reasonable/prudent measures and terms/conditions for federal actions in watersheds that contain bull trout:

- Apply the results of watershed analysis...and consider expected benefits to bull trout during the design and prioritization of instream habitat enhancement and restoration projects, culvert replacement upgrades, and road decommissioning actions.
- Ensure that the timing of any work within ...stream channels associated with these projects is designed to minimize/reduce short-term adverse effects to aquatic habitat and bull trout.
- To avoid or minimize incidental take associated with the adverse effects of road construction, reconstruction and maintenance...apply the pertinent standards and guidelines for road construction and decommissioning as described in the LRMPs, as amended....
- New roads (temporary, semi-permanent or permanent) in RHCAs shall be minimized to the greatest extent possible, and shall be constructed only where watershed analyses have been completed...

- Minimize/reduce the adverse effects of mining actions...that result in take of the species by implementing all relevant standards and guidelines (e.g., MM-1, MM-2, etc.).

FC-RONR Wilderness Management Plan

The FC-RONR Wilderness Management Plan (USDA 1985, as amended) includes direction to: "Provide habitat conducive to maintaining the natural distribution and abundance of native species of wildlife and fish by allowing only natural processes, or the restoration thereof, to shape habitat and affect interactions among species."

Additional FC-RONR Wilderness direction that applies to fisheries:

- Management activities that affect the fish and wildlife resource will be coordinated with the Idaho Department of Fish and Game, and the U.S. Fish and Wildlife Service, and NOAA fisheries.
- Threatened and Endangered (T&E) species habitat will be protected, as directed by the Endangered Species Act of 1973.
- State of Idaho Species of Special Concern (including westslope cutthroat trout and redband/rainbow trout, Pacific lamprey, and white sturgeon) will receive protection and management consideration complementary to Department goals and objectives when consistent with wilderness objectives. (Pacific lamprey and white sturgeon do not occur in the analysis area).
- Habitat improvement by other than natural means is prohibited unless authorized by the Chief of the Forest Service, or as provided elsewhere in this plan.
- Maintenance of fish....habitat will take precedence over pack and saddle stock use.
- Obtain habitat and population data on both game and non-game fish and wildlife species in the Wilderness. Place special emphasis on Forest Service designated sensitive species and State of Idaho Species of Special Concern.
- Protect both resident and anadromous fish spawning and rearing habitat.
- Maintenance of wilderness values will be overriding if fish and wildlife management objectives are incompatible with other general wilderness values.

The FC-RONR Wilderness Management Plan also includes direction for Management Indicator Species (including chinook salmon, steelhead, westslope cutthroat trout, and redband/rainbow trout and white sturgeon) that have been selected for Wilderness management evaluation practices. All these species, with the exception of white sturgeon (a species that does not occur in the analysis area), will be analyzed in this document.

Threatened and Sensitive Fish Species Direction

***Chinook Salmon*:** Snake River spring/summer chinook salmon (hereafter referred to as "chinook salmon") were listed as threatened on April 22, 1992 by the National Marine Fisheries Service (NMFS) (57FR14653). Critical habitat for chinook salmon was established December 28, 1993 (58FR68543). Designated critical habitat for Snake River spring/summer chinook salmon consists of river reaches of the Columbia, Snake, and Salmon Rivers, and all tributaries of the Snake and Salmon Rivers (except for the Clearwater River) presently or historically accessible to Snake River spring/summer chinook, except reaches above impassible natural falls and Hells Canyon Dam. The analysis area is part of the chinook salmon's critical habitat due to historical use.

***Steelhead*:** Snake River steelhead (hereafter referred to as "steelhead") were listed as *threatened* August 18, 1997 by the NMFS (62FR43937). Critical habitat for steelhead was established February 16, 2000 (65FR7764). The rule designating critical habitat for steelhead was suspended April 30, 2002 by the U.S. District Court for the District of Columbia, and remanded to NMFS to conduct new rulemaking procedures due to an inadequate economic analysis (U.S. District Court for the District of Columbia memorandum order, April 30, 2002).

***Bull Trout*:** Columbia River bull trout (hereafter referred to as "bull trout") were listed as *threatened* June 10, 1998 by the United States Fish and Wildlife Service (USFWS) (63FR31647). Critical habitat for bull trout has been proposed, but not designated by the USFWS at this time. Should the proposed critical habitat be designated for the vicinity of the Golden Hand Mine project before the Record Of Decision (ROD) is signed, the Forest Service will conference with the USFWS on critical habitat standards and guidelines.

***Westslope Cutthroat Trout*:** Westslope cutthroat trout are designated as *sensitive* by the Intermountain Regional Forester (USDA Region 4 1995). Westslope cutthroat trout were petitioned in 2000 for listing (65FR20120) under the Endangered Species Act but were not approved for listing by the USFWS (65FR21020). Critical habitat for cutthroat trout is not applicable at this time.

Analysis Area

The majority of the proposed project activities would occur on the Golden Hand lode mining claims No. 3 and No.4 (Figure 2-1, Chapter 2). The claims are adjacent to an unnamed tributary of Coin Creek, a tributary of Beaver Creek, which flows into Big Creek. The project area also includes the travel route between the claims and the Walker Millsite. This route (16.4 miles) includes FS Trail #013 and FR 371, 373, and 343 (Figure 1-2, Chapter 1). The travel route occurs within the Smith Creek, Logan Creek, and Coin Creek drainages, which all drain into Big Creek.

The analysis area for fish extends to all subwatersheds (6th level Hydrologic Unit Code (HUC)), in which the project area occurs, including: Upper Beaver Creek, Lower Beaver Creek, Hogback-McFadden, Smith Creek, Logan Creek, and Upper Big Creek (Figure 3-11). The streams in this area include Upper Big Creek and its tributaries, including Beaver, Smith, North Fork Smith, Logan and Coin Creeks. Big Creek flows into the Middle Fork Salmon River, and is within the Lower Middle Fork Salmon River 4th level USGS (HUC).

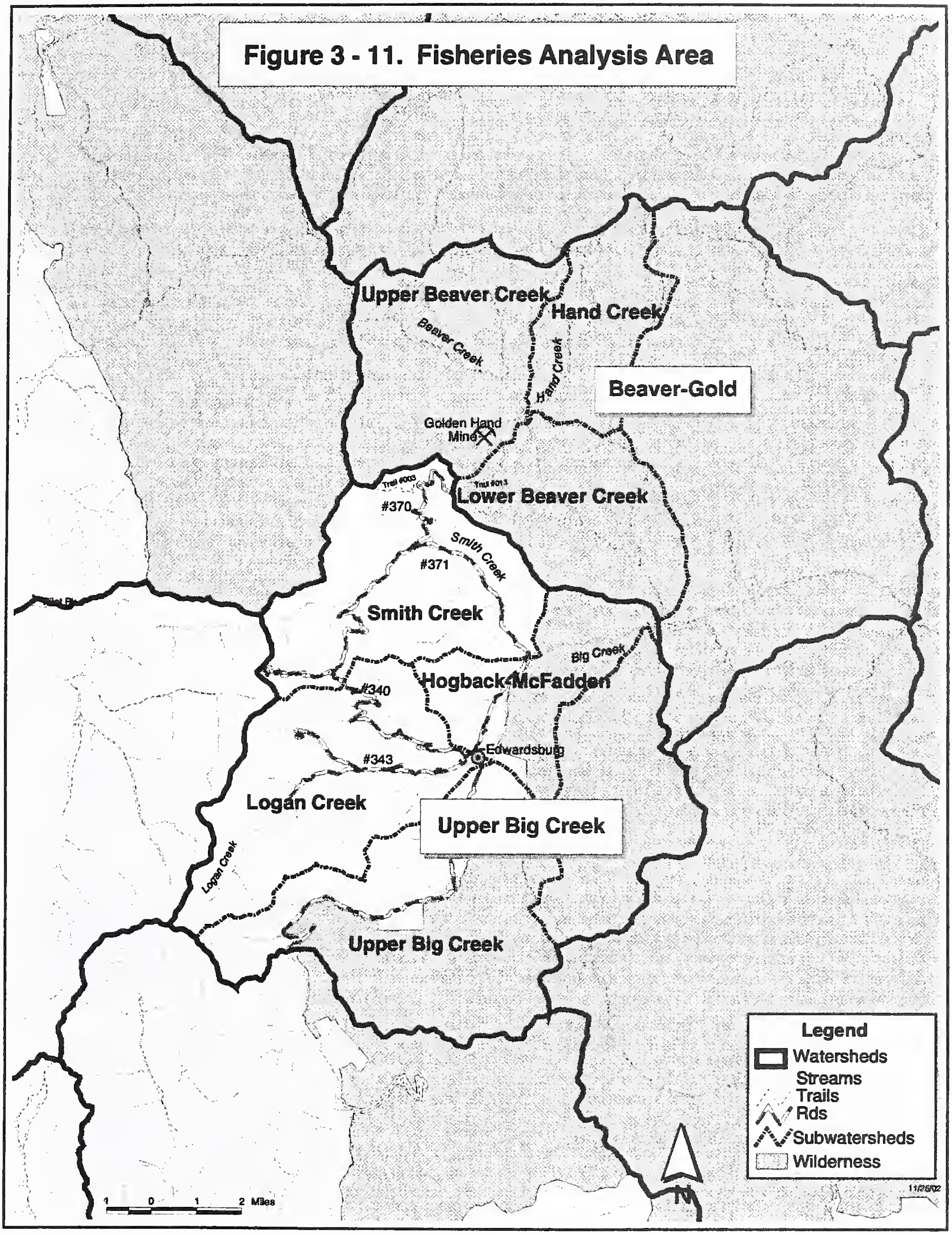


Figure 3 - 11. Fisheries Analysis Area
Upper Beaver Creek
Hand Creek
Beaver Creek
Hand Creek
Beaver-Gold
Golden Hand Mine
Lower Beaver Creek
#370
Smith Creek
#371
Smith Creek
Big Creek
Hogback-McFadden
#340
Edwardsburg
#343
Logan Creek
Upper Big Creek
Logan Creek
Upper Big Creek
Legend
Watersheds
Streams
Trails
Rds
Subwatersheds
Wilderness
N
1 0 1 2 Miles

Affected Environment

Actions that have Affected the Current Condition

More than 700 acres of privately owned land occurs in the analysis area. The analysis area includes an outfitter lodge, private summer residences, historical and active mining sites, water diversions, hydropower sites, an airstrip, and a Forest Service guard station. Grazing by livestock occurs on private lands and localized grazing by packstock occurs on NFS lands. The area supports recreational use from activities such as fishing, hunting and hiking. The majority of activities and use that contribute to area effects occur on the Smith Creek side of the analysis area.

Scattered mining disturbance in the upper Big Creek area dates back over 100 years (Cater et al. 1973). Numerous placer and lode deposits were prospected, worked, and abandoned. The Golden Hand, Velvet Quartz, and Fourth of July Mines, and a few small underground prospects located primarily in the Logan Creek drainage are still active. Walker Millsite, a small milling operation, is located along Logan Creek. A more detailed description of previous mining activities is located in the Minerals and Geology section of Chapter 3.

Existing Condition

Fish Populations

The project and analysis areas contain federally threatened, Forest Service sensitive, and PNF Management Indicator Species (MIS) described below.

Raleigh Consultants (Raleigh 1994) conducted fish presence and fish habitat surveys in Coin, Beaver, Smith, Logan, and Upper Big Creeks in 1993 and 1994 using Region 1/Region 4 Habitat Inventory guidelines (FSH 2609.23). PNF fisheries technicians inventories portions of Logan, Beaver, Coin, Smith, and North Fork Smith Creeks in 1999 and 2002 (Project Record) using modified R1/R4 Habitat Inventory guidelines. Idaho Department of Fish and Game (2002) and Accord (2002) also have conducted fish surveys in portions of the analysis area. These data have provided baseline information to evaluate current fish distribution (Table 3-7) and fish habitat condition (Table 3-8) throughout the analysis area.

Table 3-7. Documented Fish Species Presence (P) or Not Found (NF) in the Analysis Area[1]

Stream	Upper Big Cr.	Coin Creek	Beaver Creek	Smith Creek	NF Smith Cr.	Logan Creek
Chinook	P	NF	P	NF	NF	P
Steelhead	P	P	P	P	NP	P
Bull Trout	P	NF	P	P	P	P
Westslope Cutthroat Trout	P	P	P	P	P	P
Brook Trout	P	NF	NF	NF	NF	P
Redband/Rainbow Trout	P	P	P	P	NF	P
Other	whitefish					sculpin

[1]Raleigh, 1994, Unpublished data on file, Payette National Forest, 1999,2002, Accord, 2002, IDFG, 2002.

Chinook Salmon
Chinook salmon (a *threatened* species and a MIS) were documented in Beaver Creek (including upper Beaver Creek), Big Creek, and Logan Creek (Mallet 1974, Raleigh 1994, Forest Service surveys, 2002). No chinook salmon were identified in Smith Creek, but the streams appear to provide good chinook salmon habitat (Raleigh 1994). The analysis area is part of the chinook salmon's critical habitat due to historical use.

Steelhead
Tributaries of the Middle Fork Salmon River provide principal rearing habitat for steelhead (a *threatened* species and a MIS). Spawning habitat is found throughout the analysis area in the Big Creek drainage. Steelhead have been documented in the upper Big Creek, Logan Creek, Smith Creek, and Beaver Creek drainages (Raleigh 1994). Forest Service surveys (1999 and 2002) also documented steelhead in the North Fork of Logan Creek.

Bull Trout
Bull trout (a *threatened* species and a MIS) have been documented in the analysis area in Big Creek, Logan Creek, Smith Creek, and Beaver Creek drainages (Raleigh 1994). Forest Service surveys (1999 and 2002) have also documented bull trout in the North Fork of Logan Creek. Spawning bull trout (fluvial and resident) were identified in Smith Creek below the confluence of the North Fork Smith Creek. Bull trout were also observed in lower North Fork Smith Creek (Unpublished data on file, Payette NF, 2002). Critical habitat for bull trout has been proposed, but not designated by the USFWS at this time. Should the proposed critical habitat be designated for the vicinity of the Golden Hand Mine site before the Record of Decision (ROD) is signed, the Forest Service may be required to conference with the USFWS on critical habitat standards and guidelines.

Westslope Cutthroat Trout
Westslope cutthroat trout (a sensitive species and a MIS) have been documented in the Logan Creek, Smith Creek, Beaver Creek, and upper Big Creek drainages, in the North Fork of Logan Creek, and in Coin Creek (Raleigh 1994; Payette National Forest fish surveys, unpublished data, 1999 and 2002). Critical habitat is not listed for sensitive species.

Fish Habitat Conditions

PACFISH defines RMOs as "quantifiable measures of stream and streamside conditions that define good anadromous fish habitat, and serve as indicators against which attainment, or progress toward attainment, of the goals will be measured." These RMOS apply to key fisheries habitat features, also known as "indicators", such as temperature and large woody debris. The fisheries biologist examined all the habitat indicators and respective Riparian Management Objectives (RMOs), and determined that the following were the relevant habitat indicators for the analysis of effects from the proposed plan and alternatives: large woody debris, sediment, stream flow, chemical contamination, and road density and location.

In general, the following information describes habitat conditions in streams in the analysis area:

- Streams lack desired winter cover for fish in the form of deep pools.
- Channels contain abundant large woody debris (>20 pieces per mile).
- Surface fines are at desired levels (<12 percent) except in Logan Creek.
- Cobble embeddedness exceeds 20 percent in Logan and Smith Creeks.
- Stream temperatures are cool (below 12°C).

- Streams have no known chemical contamination.
- Macro-invertebrate diversity indicates good water quality.
- Road density is low, but relatively long sections of road are located in RHCAs.
- Channels are steep and entrenched, streams are cascading (Rosgen Type A) or moderately entrenched, riffle-dominated (Rosgen Type B).
- Channel average widths range from 1.7-10.2 meters.
- Channel average depths range from 0.05-0.33 meters.
- Width-depth ratios vary from 19.6-40.8.
- Stream banks are stable.

Table 3-8. Habitat Conditions for Streams in the Analysis Area

Habitat Indicator	Upper Big Cr.	Coin Cr.	Beaver Cr.	Smith Cr.	NF Smith Cr.	Logan Cr.
Pool frequency pools/mile[1]	13	0	8	34	3	10
LWD Pieces/mile[1]	92	193	125	338	283	406
Fine Sediment <6mm %[1]	3.9	2.1	6.5	7.3	2.3	21.8
Cobble Embeddedness %[2]	N/A	N/A	N/A	>20	N/A	>20
Water Temperature °C[1]	7.8	4.4	6.7	10.0	7.2	6.7
Chemical Contamination[3]	N/A	None	N/A	N/A	N/A	N/A
Macro-invertebrate diversity indicators[1]	N/A	N/A	N/A	(+58) (-67)	N/A	(+45) (-63)
Road miles in RHCA (6th HUC)[4]	7.0	.6		10.0		11.0
Rosgen Type[1]	B	A	B	A/B	A	A/B
Bank Stability %[1]	99.6	100	98.3	99.5	99.3	99.2

[1]Raleigh 1994
[2]Nelson and Burns 1999
[3]Unpublished data on file, Payette National Forest 2002
[4]PNF GIS library roads coverage, updated 2002/PNF Road Inventory, East Zone, collected 2002

Large Woody Debris (LWD)

LWD influences coarse sediment storage; increases habitat diversity and complexity; gravel retention for spawning habitat and flow heterogeneity; provides long term nutrient storage and substrate for aquatic invertebrates; moderates flow disturbances, increases retention of nutrients, and provides refugia for aquatic organisms during high and low flow events. The ability of large wood to perform these functions depends upon the size and type of wood. The importance of various components of fish cover such as surface turbulence, woody debris, aquatic vegetation, water depth, undercut banks, overhanging bank vegetation, and large substrate vary among streams, and even among reaches within a stream (Bisson et al. 1987).

Coin Creek and North Fork of Smith Creek are headwater streams with abundant LWD cover. Coin Creek had 193 LWD pieces/mile, and North Fork of Smith Creek had 283 pieces of LWD/mile during 1993 and 1994 surveys (Table 3-8). In these small, steep headwater streams (1st and 2nd order), large volumes of stable LWD tend to dominate hydraulic processes. Large debris-dams protect the downstream reaches from rapid changes in sediment loading, which may degrade spawning gravels, fill pools, and reduce invertebrate populations (Spence et al. 1996).

Smith Creek is a 3rd order stream, Upper Big and Beaver Creeks are 4th order streams; both have large, abundant pieces of LWD. Smith Creek had 338 pieces/mile, Upper Big Creek had 92 pieces/mile, and Beaver Creek had 425 pieces of LWD per mile (Raleigh 1994).

In these mid-order streams (3rd or 4th order), large woody debris functions primarily to increase channel complexity and flow heterogeneity by anchoring the position of pools along the thalweg, or the line in a stream followed by the majority of flow, creating backwaters along the stream margin, causing lateral migration of the channel, and increasing depth variability (Maser et al. 1988). Average diameter, length, and volume of pieces of wood are generally greater in mid-order streams than in low-order streams (Spence et al. 1996).

Sediment

Fine Sediment Levels

Sediment fines are classified as less than 6 mm in particle size using the Forest Service R1/R4 Habitat Inventory Surveys. Salmon survival and production are reduced as fine sediment increases, producing multiple negative impacts on salmon at several stages. Increases in fine sediment entombs incubating salmon redds, reduces egg survival by reducing oxygen flow, alters the food web, reduces pool volumes for adult and juvenile salmon, and reduces the availability of rearing space for juveniles, rendering them more susceptible to predation. High levels (generally greater than 20 percent) of fine sediment can cause an overall loss of productivity and diversity within a stream. Sediment fines are classified as less than 6 mm in particle size. When the percentage of fine sediment exceeds 20 to 30 percent in spawning riffles, survival and emergence of salmonid embryos begins to decline (Bjornn et al. 1977).

Streams within the analysis area had fine sediment levels of 2.1 to 7.3 percent, with the exception of Logan Creek, which had a 21.8 percent fine sediment level (Table 3-8, Raleigh 1994).

Cobble Embeddedness

Cobble embeddedness is the degree in which substrate particles 64-256 mm in diameter are surrounded or covered by fine sediment. The rearing capacity of salmon habitat is decreased as cobble embeddedness levels increase. Embeddedness values range from low to moderate in Big Creek tributaries, with a decreasing trend in the early 1990's indicating that these tributaries are sensitive to sedimentation (Thurow 1985, Burns and Edwards 1985). Cobble embeddedness measurements have been taken irregularly in Logan Creek and Smith Creek between 1990 and 1998. Two sites in Logan Creek each averaged 21.8 percent, and two sites in Smith Creek averaged 22.1 percent and 18.9 percent (Nelson and Burns 1999).

Stream Flow

Raleigh (1994) noted that one of the major limiting factors for fish habitat in Coin Creek was low stream flow. The best available data for low flow in Coin Creek is an estimate at the mouth of

Coin Creek of 0.71 cubic feet per second (CFS) in late September, 1993, and upstream on Coin Creek, where flows were an estimated 0.5 CFS near the claims and Forest Trail 013 in August, 2002 (Raleigh 1994, Rygh and Zuniga, pers. comm., August 2002). The 1993 and 1994 estimates of low flow using a float device was not a precise measurement. The flow could have been over or underestimated (Zuniga, pers. comm. 2002).

Frequency and magnitude of stream discharge strongly influence substrate and channel morphology conditions, as well as the amount of available spawning and rearing area for salmon. Increased peak flows can cause redd scouring, channel widening, incising of the stream channel, and increased sedimentation. Lower stream flows are more susceptible to seasonal temperature extremes in both winter and summer. The dewatering of reaches can block salmon passage (NMFS 1996).

Chemical Contamination

A water sample was taken from Coin Creek in October 2002 below the historic mining disturbance. Chemical analysis determined that all metals in the sample were below detection limits. A sample was also taken from an adit discharge at the mine site that infiltrates into the waste rock dump. The water sample showed total metal concentrations below the detection limits except for lead (1 ug/L) (unpublished data, PNF, 2002). The adit lead concentration is below the EPA freshwater chronic criterion of 2.5 ug/L (expressed as dissolved) (see discussion in Soil and Water Resources). Water from the adit does not flow into any live stream and there is no aquatic life in the vicinity of the adit or waste dump. No evidence of other acidic drainage has been observed from the historic adits or open cuts in the claims area.

Mining-related toxic substances (heavy metals, acid drainage) have had an effect on upper Marble Creek and have potential to affect Upper Big Creek tributaries (Faurot 1994). Heavy metals, inorganic and organic chemicals, water temperature, turbidity, dissolved gases (nitrogen and oxygen), nutrients, human waste, and pH all influence water quality and the ability of surface waters to sustain fish populations. If the magnitude or concentration of any of these factors exceeds the natural range for a specific location and time of year, biological processes are altered or impaired (Spence et al. 1996).

Roads are located adjacent to Big Creek and its tributaries, and the possibility of a toxic fuel spill exists (Faurot 1994). Fuels and petroleum products are moderately to highly toxic to salmonids, depending on concentrations and exposure time (Gutsell 1921, Allen and Dawson 1961).

Road Density and Location

Road densities can have substantial impacts on watershed and stream conditions. Roads within Riparian Habitat Conservation Areas (RHCAs) are of particular concern (FEMAT 1993). RHCAs include riparian corridors, wetlands, intermittent streams, and other areas that help maintain the integrity of aquatic ecosystems. Protection of these areas is vital in maintaining current and future sources of large woody material, intact riparian vegetation communities, and functional ecological processes of temperature regulation (water, air, and soil). Protection of RHCAs is often accomplished by delineating the riparian area with a buffer, and restricting or prohibiting management activities, such as roads, within these areas (FEMAT 1993).

Table 3-9 displays the length of roads located in RHCAs within the project area. Approximately 27 percent of the total road miles in the project area are located within RHCAs.

Table 3-9. Roads within RHCAs in the Golden Hand Mine Project Area[1]

Road #	Stream	6th Field HUC	Road Length (miles)	
			In Project Area	In RHCAs[2]
342	Logan Creek	Logan Creek	5.4	2.6
371	McCorkle Cr.	Hogback-McFadden	1.5	0.7
371	Big Creek	Hogback-McFadden	1.1	0.4
371	Smith Creek	Smith Creek	4.3	2.7
373	NF Smith Cr.	Smith Creek	4.1	1.6
Overall			16.4	8.0

[1]Classified: roads wholly or partially within or adjacent to NFS lands needed for long-term motor vehicle access, including state roads, county roads, privately owned roads, NFS roads, other FS authorized roads.
[2]RHCAs estimated from GIS 1:100,000 scale stream layer by placing 150-ft. buffers around first order streams and 300 ft.-buffers around all others.

Table 3-10 displays roads and road densities in the analysis area. Overall, classified road densities across the watersheds are low (0.35), but the combined densities of classified and unclassified roads in RHCAs are of concern at 1.73 miles per square miles of RHCA.

Table 3-10. Roads and Road Density within RHCAs in the Golden Hand Analysis Area

	Total Area (acres)		Road Length (miles)				Road Density (mi/mi^2)			
			In Analysis Area		In RHCAs		In Analysis Area		In RHCAs	
Analysis Area 6th Hucs	**Area**	**RHCA**	**Classified**[1]	**Un-Classified**[2]	**Classified**	**Un-Classified**	**Classified**	**Un – classified**	**Classified**	**Un-classified**
Logan Cr.	13777	1852.1	11.5	17.0	6.6	4.6	0.53	0.79	2.27	1.59
Lower Beaver Creek	9238	1349.7	0	0	0	0	0.00	0	0	0
Smith Creek	12984	1863.1	16.1	8.1	7.4	2.6	0.79	0.40	2.54	0.89
Upper Beaver Creek	12232	2161.3	0	0	0	0	0.00	0	0	0
Upper Big Creek	17859	2918.0	9.3	6.3	4.7	2.3	0.33	0.23	1.03	0.5
Hogback McFadden	7280	1040.7	2.8	2.1	1.0	0.4	0.25	0.16	0.6	0.25
Overall	**73370**	**11184.9**	**39.7**	**33.5**	**19.7**	**9.9**	**0.35**	**0.33**	**1.13**	**0.6**

[1]Classified: roads wholly or partially within or adjacent to NFS lands needed for long-term motor vehicle access, including state roads, county roads, privately owned roads, NFS roads, other FS authorized roads.
[2]Unclassified: roads not constructed or maintained or intended for long-term use.

Road Density

Table 3-10 shows existing road densities in subwatersheds in the analysis area. Road densities are generally low when measured across watersheds. The highest (classified and unclassified combined) road densities are located in Logan Creek (1.32 mi/mi^2) and Smith Creek (1.19 mi/mi^2). The highest (classified and unclassified combined) road densities in RHCAs occur in the Logan Creek subwatershed. Of the 73.2 miles of roads in the analysis area, 30.2 miles (almost 40 percent) are located within RHCAs.

Several studies document aquatic habitat or fish density changes associated with road density. Eaglin and Hubert (1993) show a positive correlation with numbers of culverts and stream crossings and amount of fine sediment in stream channels, and a negative correlation with fish density and numbers of culverts in the Medicine Bow National Forest. Macro-invertebrate diversity negatively correlates with an index of road density (McGurk and Fong 1995). Increasing road densities are associated with decreased likelihood of spawning and rearing of non-anadromous salmonids in the upper Columbia River basin, and populations are negatively correlated with road density (Lee et al. 1997).

Road Conditions

About half the roads in the project area are classified (39.7 miles), and half are unclassified (33.5 miles). Classified roads in the analysis area are native-surface roads used by miners, hunters, and the general public. These roads are occasionally maintained. Unclassified roads in the analysis area are not used or maintained on a regular basis. In portions of the analysis area, cut and fill slopes along the roads are unstable, and road surface drainage is inadequate, resulting in altered hydrological patterns that have increased sedimentation (Wagoner 2001).

The effects of roads include increases in fine-sediment delivery to streams; barriers to migration, water temperature changes, and alterations to stream flow regimes. Improper culvert placement at road-stream crossings can reduce or eliminate fish passage (Belford and Gould 1989), and road crossings are common migration barriers to fish (Clancy and Reichmuth 1990, Evans and Johnston 1980). Road/stream crossings and stream connected erosion problems on roads in the project area are discussed in the Soil and Water Resources section.

Environmental Effects

Large Woody Debris (LWD)

Large woody debris provides hiding cover, shade, bank stability, and contributes to pool quality. Most large woody debris is contributed to streams from an area within one site potential tree height of the stream course. Tree removal within 0.75 tree heights from the stream channel can have negative effects on stream shade (FEMAT 1993). The maximum site potential tree height for forests in the vicinity of the claims was conservatively estimated to be 100 ft (30 m) (Christianson, pers. comm., 2002). Hence, tree removal within RHCAs could reduce LWD recruitment. Tree removal within 75 feet of streams in the claim area could have negative effects on stream shade. LWD is currently abundant in the streams of the project area, but cutting and removing trees in RHCAs can reduce the input of future LWD needed to increase habitat diversity and complexity, gravel retention for spawning habitat, and flow heterogeneity; long term nutrient storage and substrate for aquatic invertebrates, moderates flow disturbance, increase retention of nutrients, and provide refugia for aquatic organisms during high-flow and low-flow events (Bisson et al. 1987).

Alternative A

Alternative A (No Action) maintains the present levels of LWD in all analysis area drainages (Table 3-8), because timber would not be removed. This alternative will not adversely affect fish habitat or listed and MIS fish species.

Alternative B

Under Alternative B, trees could be removed in RHCAs on the claims and access roads. While LWD levels are generally high in the area, Alternative B does not specify the size or amount of trees that could be cut. Tree removal within 75 feet of a stream could reduce current and future recruitment and shade, resulting in increases in water temperature and decreases in macro-invertebrate diversity, channel complexity and potential habitat (Bisson et al.1987).

Alternative C

Alternative C would not allow harvest of trees on the claims, but would allow for trees less than 7-inch diameter breast height (DBH) to be removed from the proposed roads. Trees that are smaller than 7 inch DBH contribute little shade to streams and should have little to no effect on stream temperature. Trees necessary for mining operations would be provided from an area outside the Wilderness and outside RHCA buffers. Trees would not be removed from the Smith Creek and Pueblo Summit roads, since road widening would not occur. Trees removed from RHCAs would be placed on the streamside of the road for future recruitment of woody debris and organic input into the stream.

Alternative D

Alternative D would allow trees to be cut on the claims for mining operations, but only outside of RHCAs. Roads would not be built, reconstructed or widened, so no change to shade or loss of LWD resulting from tree removal should occur under this alternative.

Fine Sediment

Surface erosion from road surfaces, cut banks, and ditches represents a significant and, in some landscapes, dominant source of road-related sediment input to streams. Rates of sediment delivery from unpaved roads are highest in the first years after building (Megahan and Kidd 1972) and are closely correlated to traffic volume on unpaved roads (Reid and Dunne 1984).

Increased sediment would adversely affect fish and fish habitat (Chapman and McLeod, 1987). Proposed activities could directly affect lower Coin Creek, an unnamed tributary to Coin Creek, and Beaver Creek. Lower Coin Creek supports westslope cutthroat trout and steelhead. Beaver Creek, which is approximately 1½ miles downstream of the Golden Hand Mine via Coin Creek, supports spawning and rearing chinook salmon, fluvial and resident bull trout, cutthroat trout, and steelhead (Raleigh 1994, Unpublished data on file, PNF 2002). See Table 3-7 for documented fish species distribution.

Important factors controlling sediment filtering include slope and density of woody debris and ground vegetation. The steeper the slope, the wider the riparian buffer should be to filter sediment (Murphy 1995). Johnson and Ryba (1992) recommended a 100 foot (30-m) buffer to filter sediment where it is not channelized with slopes that are relatively flat to moderate in steepness (≤ 35 percent). Belt and others (1992) provided review of sediment studies examining sediment transport below roaded areas on forested soils and drew four conclusions related to riparian buffers strip design:

- Riparian buffers should be greater where slopes are steep.
- Riparian buffers are ineffective in controlling sediments resulting from channelized flows that originate outside of the riparian buffer.
- Sediment rarely travels more than 91 meters (300 feet), unless flows are channelized.
- Removal of natural obstructions such as vegetation, woody debris, and rocks, to flow within the buffer increases the travel distance of sediments.

Serious degradation of fish habitat can result from poorly planned, designed, located, built, or maintained roads (Furniss et al. 1991). The WEPP:Road interface model (Elliot et al.1999) provides a means to display the relative differences in sediment production from road construction and maintenance by alternative. The analysis of sediment production using WEPP:Road is displayed in the Soil and Water Resources section. WEPP provides general numbers and does not address site-specific or short-term concerns such as passage of vehicles that are too large for the roadbed or the short-term increase in sediment levels from disturbance of the roadbed. The WEPP model also does not account for sediment production from other activities, such as drilling and trenching. These factors can result in impacts to fish that are not accounted for by this model.

Alternative A

Under Alternative A, roads would not be constructed. The WEPP-predicted sediment production from FR 371 and 373 in the project area outside of the Wilderness is 18.4 tons per year (Table 3-6, Soil and Water Resources). This sediment production, while not desirable, can be viewed for comparative purposes; inside the Wilderness, the estimated sediment production is minimal at 0.0075 tons per year.

The existing road use on FR 371 and 373 is estimated to be approximately 70 vehicles/year (Project Record). Use levels are expected to maintain or slowly increase over time. Limited road maintenance would occur, but it is likely many existing fords and road drainage problems would remain.

With exceptions such as an unexpected increase of public vehicle use and/or natural disturbance (land slide, heavy rain event, etc), Alternative A would not increase the amount of sediment currently entering the system. This alternative would not result in active management that could adversely affect fish habitat or listed and MIS fish species.

Alternative B

Under Alternative B, project activities that may affect sediment production include:

- 4 miles of road construction
- Road maintenance (without specified BMPs)
- Increased use of vehicles on existing roads (2 trips/day x 120 days x 10 years)
- Use of vehicles that may be too large for the existing roads (i.e., 14 cubic yd dump truck)
- Trenching (5 trenches of 750 feet total length)
- Drilling (31 sites with 48 holes)

Under Alternative B, AIMM proposes to construct 4 miles of road, drill at 31 sites (48 holes) and dig 5 trenches (approximately 750 ft). More than half of the roads, trenches, and drill sites would be constructed on slopes greater than 46 percent slope (Project Record). Slope gradient and length have been shown to be important factors influencing erosion rates (Burroughs and King 1989). On gentle slopes, buffers of 30 meters (100 feet) may be sufficient to filter sediments, whereas on steeper slopes, buffers of 90 meters (about 200 feet) or more may be needed (Spence et. al 1996). Swift (1985) found that on slope of 47 percent slope, the maximum sediment travel distance through forest litter was 314 feet with an average distance of 65 feet. The activities proposed under Alternative B, most of which are proposed on steep slopes with no identified BMPs, are likely to substantially increase the amount of sediment entering streams and degrade fish habitat.

In the Wilderness (Upper and Lower Beaver Creek subwatersheds), Alternative B proposes construction of approximately 4.0 miles of road. Although approximately 3.5 miles of these roads (see Alternative B, Chapter 2) would be constructed on abandoned roadbeds, these roadbeds would require blading of the surface and widening to accommodate large equipment. The roadbeds cross an unnamed perennial stream at three locations and an unnamed intermittent stream at two locations. All crossings are currently fords. New roads would total approximately one half mile (2,570 feet) and cross an unnamed intermittent stream at three locations.

The projected increase in sediment delivery to streams over baseline was modeled using the WEPP model. Under Alternative B, sediment levels increased to 5.1 tons per year inside the Wilderness (Table 3-6, Soil and Water Resources). Road construction is expected to increase sediment levels in Coin Creek and possibly downstream in Beaver Creek. These effects are expected to degrade fish habitat in the Wilderness portion of the project and analysis area. Outside of the Wilderness (Smith Creek Subwatershed), FR 371 and 373 would have some maintenance without specified BMPs. The roads are expected to be widened to 10 to 12 feet and bladed to accommodate heavy, large equipment travel. Sedimentation would be expected to increase in the short-term, because no measures were proposed (i.e., silt fencing, buffers from

streams) to reduce the impacts of the project's ground disturbance. The WEPP model predicts sediment production would increase from the proposed roadwork from 18.4 tons per year to 19.6 tons per year. Minimal maintenance of fords (some graveling of approaches) and roads (installation of some dips) has been proposed.

The WEPP model is capable of considering differences to soil, topography, and climate to provide recommendations for combinations of cross-drain spacing and buffer zone width, but erosion and sedimentation controls are only effective if properly spaced, constructed and applied (Morfin et al. 1996). Another potential effect to sediment levels not displayed by the WEPP model is an increase in road use. Alternative B would allow for an approximate three to four-time increase in traffic volume on FR 371 and 373. Average use on these roads is estimated to be approximately 70 vehicle round trips a year. AIMM may make as many as 250 round trips each year for 10 years.

The planned trench excavation would also increase sedimentation. Although all trenches appear to be excavated on or near a road, the majority of the trenches would result in new ground disturbance. Studies suggest that for non-channelized flow, sediment rarely travels more than 300 feet (Belt et al.1992). These studies may apply to trenches "C", "B", and "E" because they are oriented perpendicular to the slope. Trench "C" and "A" cross or come within a few feet of streams, resulting in a high risk of sediment input to waterways. Trench "A" and "D" are oriented on the map somewhat parallel to the slope of the land (Figure 2-1, Chapter 2). This orientation may channelize sediment down slope. Channelized sediment flows can move thousands of feet and are limited by the amount and frequency of flow (Belt et al.1992). Trenching using a bulldozer, track hoe, or backhoe would excavate and side cast large amounts of soil, rock, and vegetation on steep slopes. The trench design for Alternative B has high potential to increase sediment into RHCAs and stream waterways because work areas are either in or next to streams. All trenches lie within 100 to150 feet of either a perennial or intermittent stream.

Drilling activities could also cause increases in sediment. The average drill pad is expected to be approximately 400 to 500 square feet. Thirty-one drill pads are planned. Although the drill pads appear to be located on the planned roads, most drill locations are on steep slopes (> 46 percent). Inappropriate side casting and widening of the roadbed associated with drilling activities would increase sediment production. This sediment could be expected to enter streams, especially at the approximately 20 drill locations that could occur inside RHCAs.

Alternative C

Under Alternative C, project activities that could affect sediment production include:

- 3.4 miles of road construction
- Road maintenance using BMPs
- No roads constructed in RHCAs except for light construction on old roadbeds
- Increased use of vehicles on existing roads (2 trips/day x 120 days x 3-5 years)
- No trenching
- Drilling (sequenced - up to 31 sites) in RHCAs only with mitigation measures

Alternative C allows for vehicle access to the claims with modifications to protect resources. The total amount of road construction would decrease slightly from Alternative B to 3.4 miles. This work would occur on old roadbeds and would be limited to light construction activities such as blading to the existing width. Blades for equipment would not be used for a distance of 25 feet

from streams. Vehicles would be restricted in size which makes it possible to the minimize widening of the roadbed. Roads constructed in areas without old roadbeds must occur outside of the 150-foot buffer for perennial and 100 foot buffer for intermittent streams. Drilling must occur on roadbeds or on platforms to minimize ground disturbance and potential sediment production. All activities would incorporate Best Management Practices (BMPs) (see Chapter 2 and Appendix D) and mitigation measures (see Roads and Access Management section and Minerals and Geology section) to reduce the impacts of sediment.

Alternative C includes a number of road maintenance measures on FR 371 and 373 that would improve fish habitat conditions in the North Fork of Smith Creek and Smith Creek. These include installation of a bridge, culverts, and armored stream crossings. Roads would not be widened under this alternative. Installing drivable dips and gravelling stream approaches would improve the travel route and minimize sediment production. Short-term increases in sediment could occur during installation of culverts, dips, bridge, and geogrid (an expandable plastic grid material used for soil and substrate stabilization), but BMPs would minimize these effects, and the long-term benefits would be expected to greatly outweigh the short-term effects (Swift 1988).

The benefits of mitigation measures included in Alternative C are shown in the WEPP model results. Under Alternative C, the model predicts that sediment production from FR 371 and 373 would decrease from 18.4 to 1.5 tons per year (Table 3-6, Soil and Water Resources).

The WEPP model shows the negative effects of any road construction in the Wilderness. Although Alternative C is predicted to produce less sediment than Alternative B (1 ton per year versus 5.1 tons per year), sediment levels would still increase. Although the current conditions are functioning appropriately, these effects may degrade fish habitat in the Wilderness portion of the project and analysis area.

Alternative C includes provisions to limit the timing and duration of the activities and hence limit sediment production. Alternative C would allow increased vehicle use on FR 371 and 373 by approximately 250 trips/year but only for three years (with a provision to extend two years under emergencies). By limiting the amount of time for the proposed operations, the associated vehicle use would impact streams for a shorter time period. In addition, vehicles would be limited in size so few impacts to road banks and stream crossings would occur. The requirement to complete all activities within a shorter time period (3 to 5 years) would result in less vehicle trips.

The Forest Service would be granted access to drill samples in order to verify data and, with the operator, determine what further activity would be reasonably incident to mining. This sequencing of drill sites could allow for less sedimentation if no ore is found in the initial year or two and the project is discontinued. Sequencing would prevent unnecessary drilling within the Wilderness.

In summary, Alternative C is expected to benefit road conditions, sediment delivery, and fish habitat outside of the Wilderness. Inside the Wilderness, Alternative C would result in fewer sediment-related impacts than Alternative B because it requires less road construction, no trenching, use of smaller motorized equipment, limits on work inside RHCAs, no new stream crossings, and requires drill sites to be on platforms. In addition, BMPs (Appendix D) and mitigation measures for roads (Roads and Access Management Section) and drill sites (Minerals and Geology section) would keep sediment from entering the streams. All of these measures would lessen the amount of sediment entering the streams and reduce the risk of harming listed and MIS fish species.

Alternative D

Under Alternative D, project activities that could affect sediment production include:
- No new road construction
- Road maintenance using BMPs
- Increased use of vehicles on existing roads (2 trips/day x 120 days x 3-5 years)
- No trenching
- Sequenced drilling restricted to indicated and inferred ore reserves (up to 14 sites)

Under Alternative D, all access into the Wilderness would be by primitive means (on foot or with pack stock). No roads or trenches would be constructed. Development work would be focused on the area of the Glory Hole ore reserve with up to 14 drill holes. These actions would greatly limit the amount of ground disturbance in the Coin Creek drainage.

In general, drill sites would be limited to abandoned roadbeds and sites outside of RHCAs. Where drilling data shows a need to drill within RHCAs, these sites could be drilled up to 50 feet from live water with additional mitigation measures (see BMPs in Appendix D and drill site mitigation measures described in the Minerals and Geology section) to reduce the chance of sediment entering the streams. These same mitigation measures – primarily the use of platforms -- would be used when drilling off roadbeds. The platforms would reduce the area of ground disturbance, thereby limiting sediment production. All of these measures would reduce the chance of sedimentation into the perennial and intermittent streams that lie on and next to claims No. 3 and No. 4.

Alternative D includes the same road improvements for FR 371 and 373 as Alternative C to improve fish habitat conditions in the North Fork of Smith Creek and Smith Creek. These include installation of a bridge, culverts, and armored stream crossings. Roads would not be widened under this alternative. Installing drivable dips and gravelling stream approaches would improve the travel route with subsequent benefits to fish habitat. Short-term increases in sediment could occur during installation of culverts and dips, but BMPs would minimize these effects. The long-term benefits would be expected to greatly outweigh the short-term effects (Swift 1988) (for further discussion, refer to Alternative C above).

Overall, sediment production from Alternative D would be less than Alternative B and C. The WEPP model results predict no change in sediment production in the Wilderness (Table 3-6, Soil and Water Resources). Lack of sediment in the model and in actuality would be due to no road construction, trenching (occurs in Alternative B only), or motorized use in the Wilderness. Outside of the Wilderness, sediment would decrease compared to Alternatives A and B due to a variety of road improvements. All of these measures would result in less sediment entering project area streams and reduce the risk of harm to listed and MIS fish species.

Stream Flow

Stream flows are a critical part of fish habitat and viability. Changes in flow can reduce fish habitat quality by increasing stream temperatures, resulting in reduction of productivity and access to habitat (i.e., pools). The stream flows for the project area are generally high in spring during snowmelt and during winter rain-on-snow floods, and generally low in late summer and during winter stream freeze-ups. Environmental factors (climate, snowfall, drought, etc.) affect

annual stream flows. Minimum flow in summer can limit the carrying capacity of aquatic ecosystems and are a critical part of fisheries habitat and fish viability (Murphy 1995).

Where water is withdrawn from smaller rivers and streams, seasonal or daily flow fluctuations can adversely affect fish, macro-invertebrates in littoral areas, aquatic macrophytes, and periphyton (attached algae) (Ploskey 1970). Fluctuating water levels can delay spawning migrations, impact breeding condition, reduce salmon spawning area (Beiningen 1976), dewater redds and expose developing embryos, strand fry (CRFC 1979), and delay downstream migration of smolts. The literature suggests that irrigation diversions contribute to low flows and are likely to inhibit or delay salmonid smolt migration. This delay could limit fish survival and reduce potential numbers of returning adults (NWPPC 1986). Where low flows are made extreme, the reduced living space, reduced cover availability, and elevated temperature can significantly reduce fish populations (Orth and White1993).

Maintenance of ninety percent of normal stream flow contributes substantially toward the protection of fish migration, spawning and other life stages at and down stream of diversions (Orth and White 1993). The precision commonly assigned to flow measurement procedures is often plus or minus 10 percent of the measured flow value (Burns, pers. comm. 2002). Based on these two references, the ID Team fisheries biologist determined for the purposes of this analysis that proposed water diversions estimated to be greater than 10 percent of the low flow of the stream would be considered to have a negative effect on fish habitat.

Only one perennial stream occurs on the claims – an unnamed tributary to Coin Creek. Coin Creek occurs slightly west of the claim boundaries on the map approved by AIMM for this environmental analysis. Any water diversions to claim Nos. 3 and 4 would be expected to occur from the unnamed tributary, because the Central Idaho Wilderness Act stated that new diversions (defined as off claim diversions) would require presidential approval. No flow measures are available for the unnamed tributary other than a visual observation that the flow was less than Coin Creek. Because the tributary flows into Coin Creek just north of the claim boundary and upstream of known occupied fish habitat, changes in flows to Coin Creek would be used as a measure of effect to fish habitat in this analysis.

In September 1993 the flow in Coin Creek above the confluence with Beaver Creek was estimated at 0.71 CFS (Raleigh 1994). The flow in Coin Creek near the northern boundary of the claims was estimated in August 2002 at 0.5 CFS (Project Record). In addition, the 2002 PNF fisheries survey crew noted in early October that flows had dropped even further than recorded in August (unpublished data on file, Payette National Forest, 2002). The USGS average stream flows index for the state of Idaho, which averages 30-year flow data, shows August 2002 flows were slightly below normal and by October, flows had dropped well below normal (USGS water resources, Project Record).

Alternative A

Alternative A would not result in any human induced changes to stream flow. This alternative will not adversely affect fish habitat or listed and MIS fish species.

Alternative B

Under Alternative B, project activities that may affect stream flow include:

- Water withdrawal from an unnamed tributary Coin Creek

- Water withdrawal of a maximum amount of 2,500 gallons per day (GPD) and a diversion rate of 0.04 CFS
- Water withdrawal of a maximum amount of 13,000 GPD for domestic use
- No monitoring of stream flow

AIMM believes the Golden Hand mining claims may acquire the following domestic water rights that they believe to be exempt from permitting and filing requirements: (1) a right for mining operations, limited to 2500 gallons per day (GPD) and a diversion rate of 0.04 CFS; and (2) a right for all mine worker lodging and related domestic uses, limited to 13,000 GPD.

AIMM asked that two scenarios for water use be evaluated:

1. Taking the maximum amount of water for mining and domestic purposes (2,500 GPD plus 13,000 GPD).
2. Taking the amount of water based on 60 days drilling and the amount necessary to support 6 to 8 people's domestic use.

The amount of flow proposed to be withdrawn from Coin Creek solely for mining purposes (0.04 CFS) is nearly 10 percent of the estimated flow (0.5 CFS) of Coin Creek in August. Due to the variability in flow measurements and the timing of the flow observations, the amount of water proposed to be withdrawn solely for mining operations (0.04 CFS) could easily represent 10 percent of the actual low flow of Coin Creek near the claims. Because ten percent is the precision rate with which the total low flow of the stream can be measured, any withdrawal greater than this amount could result in a measurable change in flow and could negatively affect fish habitat downstream. The proposed withdrawal for domestic purposes in combination with the withdrawal for mining operations could easily exceed 10 percent of the stream flow, particularly because no diversion rate is identified for domestic purposes.

A reduction in flow could adversely affect listed fish and MIS that occur downstream by eliminating available occupied stream habitat in Coin Creek. One of the major fish habitat limiting factors is low flow for Coin Creek (Raleigh 1994). Changes in flow could reduce fish habitat by increasing stream temperatures, resulting in reduction of productivity, and access to habitat (i.e., pools) (Spence et al. 1996).

Alternatives C and D

Under Alternatives C and D, project activities that may affect stream flow include:

- Water withdrawal from unnamed tributary of Coin Creek
- Water withdrawal of a maximum amount of 2,500 gallons per day (GPD) and a diversion rate of 0.04 CFS
- Monitoring to ensure no more than 10 percent of the stream flow is removed

Under Alternatives C and D, AIMM would conform to state law and acquire a permit to appropriate water from the unnamed tributary to Coin Creek that runs through the claims. This water use would not cause adverse effects to fish if it was limited to ten percent of the low flow of Coin Creek below the confluence with the unnamed perennial stream that flows through claim No. 4. The diversion rate should be limited to 2,500 gallons per day (GPD) and a diversion rate of .04 cubic feet per second (CFS) or ten percent of the flow (as described above), whichever is less.

The Forest Service would approve the use of a waterline to be placed in the unnamed tributary of Coin Creek. The pipe must be of a diameter that it limits water use to the diversion rates and amounts described above. Flows would be measured at a point about 375 feet downstream of the confluence of Coin Creek and the unnamed tributary that flows through claim No. 4 (near where Forest Service surveys have documented listed fish species). Monitoring would occur throughout the months of operation. The water diversion rate would be reduced if the flow at the point of measurement dropped below 0.4 CFS in order to maintain a removal of less than 10 percent of the flow. A new sized intake pipe limited to the withdrawal of 10 percent or less of the stream flow would be required to replace the old intake pipe. With these provisions, Alternatives C and D would not adversely affect listed and MIS fish species.

Chemical Contamination

Fuels and other petroleum products can directly poison salmonids and their aquatic invertebrate food source. Fuels and petroleum products are moderately to highly toxic to salmonids, depending on concentrations and exposure time (Gutsell 1921, Allen and Dawson 1961). Leakage of fuel, oil, or hydraulic fluid from drilling equipment poses a risk to the environment.

Metals are also contaminants of concern when dealing with potential mining impacts to fishery resources. Ore at the mine site occurs along joints and shear planes in granite and schistose rocks of the Yellowjacket formation (Shenon and Ross 1936). Sulfides including disseminated pyrite and chalcopyrite are associated with the ore and can be found in the historic mine waste dumps. Based on field observations by project hydrologists and geologists (Project Record), sulfides exposed at the surface show considerable oxidation. Sulfides have the potential to generate acid and liberate metals to the environment. The risk of acid rock drainage and release of metals is primarily a function of the sulfide content of the disturbed rock. Additional discussion of the potential affects to water quality from chemical and heavy metal contamination are provided in the Soil and Water Resources section.

Alternative A

Alternative A would not contribute any chemical contaminants into the project area. This alternative will not adversely affect fish habitat or listed and MIS fish species.

Alternative B

Under Alternative B, project activities that may result in contamination of waterways include:

- Transport and storage of fuel and drilling additives
- Use of drilling additives
- Occupancy and use of the bunkhouse, outhouse, powder magazines, and other buildings in the vicinity of the claims
- Disposal of wastewater and garbage
- Leaks/drips of oil and/or fuel from vehicles and drill equipment
- Potential generation of acid rock drainage

Alternative B would allow use of the bunkhouse, outhouse, powder magazines, and other buildings in the vicinity of the claims. The outhouse occurs within 250 feet of Coin Creek. The facility is not level and full of human waste. The bunkhouse lies approximately 125 feet from a

perennial stream (unnamed) and approximately 300 feet from Coin Creek. Close proximity of buildings and work areas to streams could cause water contamination resulting in poorer water quality and species diversity for invertebrates and fish species. Alternative B could degrade water quality and fish habitat through chemical contamination from fuels and drilling additives, human waste, garbage, and wash water.

Alternatives C and D

Under Alternatives C and D, monitoring would be implemented to test for acid rock drainage. This monitoring would protect against the risk of such an event (see Soil and Water Resources section).

Under Alternatives C and D, specific measures are included for transport and storage of fuels. All equipment used would be inspected by the Forest Service to ensure that it is in good working order and has no visible leaks. Oil absorbent pads would be available on site and placed in advance under the drilling platform and any possible sources of fuel, oil, or hydraulic fluid leakage. Oil absorbent pads would be available for use if any petroleum contamination becomes evident in tanks containing drilling fluids. Spill containment would be required for all petrochemicals on site. The operator should adhere to the guidelines pertaining to transport, storage, handling, and disposal of hazardous materials and spill response cited in Chapter 7 of the Best Management Practices for Mining in Idaho (Idaho Department of Lands 1992). A Spill Prevention Containment and Countermeasures (SPCC) plan or something similar would be submitted for Forest Service approval prior to project implementation. A water quality-monitoring program would be required.

Alternative C does not allow use of the bunkhouse or outhouse, near the claims. Use of these buildings and occupancy on claim increases the risk of water contamination through wastewater, human waste, and garbage. Alternative D does allow for long-term (all season) camping on the claims in tents. Alternative D would result in a greater risk of human waste contamination of water quality compared to Alternative C, but this risk would probably be less than the risk to water quality associated with vehicles and heavy equipment. Drilling additives can contain metals or other ingredients that are harmful to water quality and aquatic species. Alternative C would require Forest Service approved additives for drilling. Alternative D would require that only water be used as the drilling additive. Alternative D is the least likely to result in contamination of fish habitat because no vehicles would enter the Coin Creek drainage and only water would be used as the drilling additive. Alternative D would also include monitoring to ensure the camping on the claims would not cause water contamination (See Appendix D).

Road Density and Location

Two primary ways that roads affect streams is by encroaching on the edges of the channel or flood plain and through poorly designed stream channel crossings. Inadequate stream crossings can alter the stream morphology, increase sediment into the stream, and limit or eliminate fish passage. When roads encroach on the channel, they contribute sediment to the stream and affect stream flow. This, in turn, can alter channel width, depth, local gradients, and habitat features (pools, riffles) for aquatic organisms (Harr and Nichols 1993).

The use of RHCA buffers can prevent sediment from reaching streams, maintain woody debris recruitment to streams, and protect the stream channel. Numerous researchers, including

Broderson (1973), Belt and others (1992), Ketcheson and Megahan (1990), Burroughs and King (1989), and Swift (1986), have generally concluded that 200-300 foot RHCAs are effective at protecting streams from sediment transported by non-channelized flow.

The streams in and adjacent to the mining claims are classified as perennial non-fish bearing and intermittent streams. Using PACFISH (USDA and USDI 1995) direction, the appropriate RHCA buffers are 150 feet and 100 feet, respectively, on each side of the stream. Coin Creek is considered to be fish bearing approximately ¼ mile downstream from the claim area. The appropriate buffer at that point would be 300 feet on each side of the stream. Activities on the mining claims that may affect RHCAs are of particular concern, since known occupied fish habitat is only slightly downstream from the claims.

The entire project area currently includes about 16.4 miles of road from the Walker Millsite to Pueblo Summit. About half the roads in the project area occur in RHCAs (Table 3-11). Alternatives B and C would increase roads in RHCAs in the project area. These roads would be within RHCAs of streams occupied by, or upstream of, all of the following MIS and listed species: chinook salmon, steelhead, bull trout, and westslope cutthroat trout.

FR 371 and 373 are minimally maintained, native-surfaced, improperly drained, and have inadequate turn ratios for the size of equipment proposed (Dixon, pers. comm. 2002). FS Trail #013 is also too narrow in places to accommodate the size of equipment proposed in Alternative B (Dixon, pers. comm. 2002). Under Alternative B it is expected that road use may impact side slopes and stream crossings, while road widening activities without the use of BMPs would impact side slopes and remove trees. Destabilized road margins and removal of trees from RHCAs can increase erosion (Bilby et al.1989, Donald et al. 1996, Megahan and Kidd 1972, Reid and Dunne 1984).

Table 3-11. Comparison of Roads and Crossings by Alternative

Alternative	Road Miles in Project Area	Road Miles in RHCAs	Road Miles Constructed	Drill Sites and Trenches	Stream Crossings
A	16.4	8.2	0	0	16
B	20.4	8.8	4.0	31 drill sites, 5 trenches	25
C	19.8	8.3	3.4	*up to 31 drill sites, 0 trenches	20
D	16.4	8.2	0	*up to 14 drill sites, 0 trenches	16

* Criteria needs to be met and no more than the number indicated will be allowed

Note: RHCAs= non-fishbearing perennial= 150ft, intermittent= 100ft

Alternative A

Alternative A would not increase road construction or increase the use of roads or stream fords. The condition of the 16.4 miles of road (including the 8.2 miles of road in RHCAs) would not change. This alternative would not change current fish habitat conditions.

Alternative B

Under Alternative B, project activities that may affect the road and road density habitat indicator include:

- 4 miles of road construction
- Road maintenance without specified BMPs
- Nine additional stream crossings
- Project work next to or in streams

Alternative B proposes an additional 4.0 miles of road constructed in the Wilderness. This would increase the roads in the project area by about 22 percent. Of the proposed 4.0 miles of additional road, 0.6 miles would be within RHCAs. Currently 16 stream crossings occur along FR 373 and 371. Alternative B would result in nine additional crossings in and adjacent to the claims. The addition of roads within RHCAs, the increase in stream fords, the increase in vehicle use along these routes, and having project work close to and/or within streams all contribute to the degradation of habitat indicators for aquatic and fish species.

Under Alternative B, the 16.4 miles of existing road in the project area would be used by AIMM twice a day during the operating season (estimated to be a maximum of four months) for a ten-year period. AIMM's larger vehicles (including a 14 cubic yard dump truck) and heavy equipment (including a bulldozer) would use the road once each year to travel into and out of the mining claims. Equipment for road maintenance activities would also travel the road.

AIMM proposes some road maintenance activities including installation of dips and armoring of stream crossings, if necessary. The increased use of the fords (up to four times over current use levels), with vehicles that are substantially larger than most recreational vehicles, could have the following effects: removal of riparian vegetation, direct displacement of fish within the fording area, macro-invertebrate mortality or displacement within the fording area, collapsed stream banks, agitated or redistributed instream substrate, widening of the stream in and downstream of the ford area, increased turbidity and bedload movement, and exposure fish to fuels, sediments, and other contaminants present on the vehicles. Alternative B would use larger equipment than the other action alternatives to access the mining claims. Alternative B would likely adversely affect listed and MIS fish species.

Alternative C

Under Alternative C, project activities that may affect the road and road density habitat indicator include:

- 3.4 miles of road construction
- Road maintenance with specified BMPs
- Four additional stream crossings
- Project work next to streams requires use of BMPs and mitigation measures

Alternative C would allow construction of 3.4 miles of road in the Wilderness. The majority of these roads would be constructed on old roadbeds. These old roadbeds include four existing stream crossings. About 550 feet of roads could be constructed off of roadbeds – this construction would occur outside of RHCAs. Although these activities would increase roads in

the project area, including roads in RHCAs, the work would be accomplished using BMPs and mitigation measures (Appendix D) to minimize impacts to RHCAs.

Under Alternative C, the 16.4 miles of existing road in the project area would be used by AIMM twice a day during the operating season (estimated to be a maximum of four months) for a three-year period (with two years extended due to emergencies). AIMM's larger vehicles and heavy equipment would use the road once each year to travel into and out of the mining claims, but these vehicles would be limited in size resulting in fewer impacts to road margins, stream channels, and riparian areas than under Alternative B.

Alternative C would improve road conditions in RHCAs on FR 371 and 373 through extensive road maintenance, installation of culverts, placement of dips (cross drains), and gravelling. In particular, the construction of a log stringer bridge across the North Fork of Smith Creek and installation of a geotextile fabric to armor the lower most crossing of Smith Creek would protect these stream crossings and the associated fish habitat.

Alternative C would restrict activities on the mining claims in RHCAs. Blades for equipment used on roads would not be used within 25 feet of streams. Drilling could occur in RHCAs, but only with extra mitigation measures (Appendix D).

In summary, Alternative C would increase roads in RHCAs by 0.1 miles, but this alternative also includes a number of measures to minimize impacts to RHCAs. These actions are expected to minimize impacts to listed fish species, habitat, and water quality.

Alternative D

Under Alternative D, project activities that may affect the road and road density habitat indicator include:

- No road construction
- Road maintenance with specified BMPs
- No additional stream crossings
- Project work next to streams requires use of BMPs and mitigation measures

Under Alternative D no roads would be constructed to access the mining claims in the Wilderness, hence there would be no road construction in RHCAs. Alternative D would have the same effects to road use and maintenance as described above under Alternative C. For these reasons, Alternative D is expected to benefit RHCA conditions in the project area, and is not likely to adversely affect listed or MIS fish species or habitat.

Mitigation measures and BMPs would be employed under Alternatives C and D to avoid increased sedimentation associated with the road maintenance activities. Road improvements such as these have been analyzed in the PNF programmatic Biological Assessment for Road Maintenance activities. All necessary mitigations (as described in the programmatic BA) would be employed.

Summary of Effects

Of all the alternatives, Alternative B would have the most overall impact to the fisheries habitat indictors and RMOs. This conclusion is based upon projected impacts to soil and hydrologic

resources through ground disturbance and associated transport of sediment to stream systems. Alternative B has the greatest amount of ground disturbance with the fewest mitigation measures. This includes road construction within RHCAs, trenches that cross or lie next to streams with orientations parallel to the slope of the land, mine development activities (roads, trenches, drill sites) on steep slopes (greater than 45 percent), residential occupancy of old buildings in the area with associated risks to water quality, and few mitigation measures for stream fords, road maintenance, vehicle travel, and ground disturbing activities.

Potential impacts to fish habitat indicators from Alternative B also include potential waterway contamination from fuel spills, drilling additives, or metal mine drainage. Alternative B would also reduce water flows in the Coin Creek drainage. The amount of use proposed could largely dewater Coin Creek during low flows with adverse impacts to downstream fish habitat.

Alternative C would have fewer impacts than Alternative B including less road construction, no trenches, fewer new stream crossings, restrictions on activities in RHCAs, use of smaller equipment, no residential occupancy, and mitigation measures for stream fords, road maintenance and vehicle travel, and sedimentation control of ground disturbing actions. Alternative C would include monitoring and mitigation measures to prevent water contamination and protect water flows. While Alternative C would still impact fish habitat conditions in the Coin Creek drainage, it is expected to improve the condition of FR 371 and 373, with potential benefits to fish habitat.

Alternative D would have the lowest impacts of any action alternative. No roads or trenches would be constructed in the Coin Creek drainage. Drilling activities and long-term camping would occur on the claims, but BMPs and mitigation measures would greatly reduce any risk to fish habitat from these activities. Alternative D would also include monitoring and mitigation measures to prevent water contamination and protect water flows. Road maintenance activities would improve the condition of FR 371 and 373, with potential benefits to fish habitat.

Cumulative Effects

Actions in the analysis area that may contribute to the cumulative effects of the action alternatives analyzed in this DEIS include activities on over 700 acres of privately owned land within the project area. This includes one guest outfitter lodge, private summer residences, historical and present mining activities, water diversions, hydropower sites, an airstrip, grazing by livestock on private land and by pack/saddle stock throughout localized areas, and a Forest Service guard station (See Appendix A). Outfitters and guides operate in these watersheds and are required to conform with practices to protect listed fish species. Outfitters and general recreationists should be educated about the potential detrimental effects to listed fish of water use and recreation in and around streams.

Another non-project action is the Walker Millsite that operates under a plan of operations approved by the Forest Service in 1990. The Walker Millsite includes a 50-ton per day ball mill and gravity milling process, a 50 by 100 by 7-foot deep tailings pond, 1,000 feet of access road, a water transmission line, and an explosives storage shed. The operating plan was amended in 2002 to allow relocation and temporary operation (until December 31, 2003) of a carbon-in-pulp (CIP) cyanide vat leach plant from private land to a nearby millsite on National Forest System land. These actions were determined "Not Likely to Adversely Affect" listed species or critical habitat by the Forest Service, and not likely to lead to listing of cutthroat trout.

AIMM proposes to access the Golden Hand lode mining claims Nos. 1 and 2 to conduct exploratory work (Appendix A). The use of heavy equipment and additional stream crossings would occur to the north and downstream of claims Nos. 3 and 4. Coin Creek and an unnamed tributary of Coin Creek would be crossed while traveling on the west side of Coin Creek. These activities could adversely affect fish habitat. These effects would be cumulative to any negative effects associated with the action alternatives considered in this DEIS.

In the Beaver-Gold Watershed, the effects of these actions in combination with either Alternative B or C would have adverse impacts to listed and MIS fish species and habitat by negatively affecting the habitat indicators. In the Upper Big Creek Watershed, the effects of these actions in combination with Alternative B would be cumulatively adverse. The effects of these actions in combination with Alternative C or Alternative D would be cumulatively beneficial to listed and MIS fish species.

Affected watersheds in the project area flow into the Middle Fork Salmon River. The Middle Fork Salmon River Watershed is a priority watershed (USDA and USDI 1998), and has a genetically and ecologically unique sub-population of steelhead (USDA and USDI 1998). Measures must to be taken to maintain, expand, and reconnect high quality habitats for the conservation of riparian/aquatic habitats and listed salmon. Adverse cumulative effects can limit attainment of those measures.

Forest Plan Consistency

Forest Plan consistency as guided by PACFISH is discussed above in relation to effects on PACFISH Riparian Management Objectives (RMOs) and Riparian Habitat Conservation Areas (RHCAs). Forest Plan consistency as guided by PACFISH direction for minerals is described in the Minerals and Geology section. Alternative D is most consistent with Forest Plan direction as amended by PACFISH. Alternative C is somewhat consistent with Forest Plan direction. Alternative B is not consistent.

The Biological Opinion for the Land and Resource Management Plans for the: Boise, Challis, Nez Perce, Payette, Salmon, Sawtooth, Umatilla, and Wallowa-Whitman National Forests (NMFS 1995) states that for high priority watersheds concerning mining, a watershed analysis prior to approving plans of operation for “likely to adversely affect” actions (exceptions: *de minimis* risk activities).

The Biological Opinion (BO) for the Effects of the Management Activities on the Payette National Forest on the Steelhead (NMFS 1998) states that federal actions in the MFSR are subject to the following mitigation measures:

- Build new roads only to replace existing roads in RHCAs, or directly repair human-caused damage to steelhead habitat in streams.
- Do not widen roads by increasing cut and fill slope areas in order to accommodate more traffic and/or larger vehicles than can presently use the road.
- Do not open closed and revegetated roads for management purposes unless necessary to repair human-caused damage to steelhead habitat.
- Do not harvest in RHCAs

The BO for Effects to Bull Trout from Continued Implementation of Land and Resource Management Plans and Resource Management Plans as Amended by the Interim Strategy for Managing Fish-producing Watersheds in Eastern Oregon and Washington, Idaho, Western

Montana, and Portions of Nevada (INFISH), and the Interim Strategy for Managing Anadromous Fish-producing Watersheds in Eastern Oregon and Washington, Idaho, and Portions of California (PACFISH) (USFWS 1998) also outlines reasonable/prudent measures and terms/conditions for federal actions in watersheds that contain bull trout. These measures are similar (but often less stringent) than those described in the steelhead BO.

Alternatives B and C would not be consistent with measures required by the Biological Opinions because:

- new roads would be built in RHCAs
- some of these roads would be built on revegetated roadbeds
- existing roads could be widened to accommodate larger vehicles (Alternative B)
- tree removal could occur in RHCAs (Alternative B)

Under Alternative B or Alternative C, mitigation measures prescribed in the BOs would not be followed and risk to listed species may not be avoided if either alternative is selected, particularly if Alternative B is selected. Consultation may need to be reinitiated to discuss the effects of this non-adherence to BO direction.

Irreversible and Irretrievable Commitments

With any of the action alternatives there is the risk of sediment delivery to a stream or streams in an amount that may retard RMO attainment and adversely impact fish species and habitat. Thorough implementation of management direction and mitigation measures described in Alternatives C and D would minimize sediment movement and delivery, and prevent irreversible and irretrievable commitments in terms of loss of fish habitat or viability or fish populations.

Wildlife Resource

Scope of the Analysis

Issue #8: The effects of the proposed activities on wildlife populations and habitat of concern (threatened and endangered wildlife species; Region 4 sensitive species; Management Indicator Species [MIS]; and Idaho Species of Concern).

Indicators

- Amount of habitat modified for threatened, endangered, MIS, Region 4 sensitive species, and Idaho Species of Concern.
- Effects of human activity on wildlife populations

Background

Mining and mining-related activities can adversely affect wildlife and wildlife habitat by increasing human presence in the area, altering habitat through project activities, and creating noise and other disturbances. The mining activities, the proposed vehicle use in the Wilderness, and the proposed occupancy may modify wildlife movements and displace wildlife populations during the operating season.

Major Comments: Comments from the public, agencies, organizations, and Tribal Governments highlighted concerns with effects to threatened and endangered species as a result of the mine operations, and the impacts of noise and waste generated by the mine to wildlife in the vicinity. Additional information on comments received is provided in Chapter 4.

Management Direction

The Forest Plan goal for wildlife management follows National Forest Management Act (NFMA) direction to "provide a variety and diversity of habitat throughout the Forest to support viable populations of all native vertebrate species" (Forest Plan, p. IV-25). NFMA also directs National Forests to identify MIS whose habitat conditions or population changes are used to assess the impacts of management activities on similar species in a particular area. MIS are generally presumed to be sensitive to habitat changes. Forest Plan direction to maintain MIS and their habitat includes "sustain populations of MIS over the long term" (Forest Plan, p. II-27). Forest Plan MIS are listed in Table 3-12.

The FC-RONR Wilderness Management Plan lists four additional wildlife species (otter, blue grouse, bighorn sheep, and mountain goat) to be used as MIS (FC-RONR Wilderness Management Plan, p. 27). These species are also displayed in Table 3-12.

The Forest Plan reflects Endangered Species Act (ESA) requirements that specify all NEPA projects be coordinated with the Fish and Wildlife Service for effects to threatened, endangered, and proposed species (TEPS). Forest Plan direction for TEPS includes "manage threatened and

endangered species habitat consistent with recovery plan objectives" (p. IV-25). Species currently listed as TEPS on the Payette National Forest (PNF) are shown in Table 3-12. There are currently no proposed species listed on the PNF.

The current Forest Plan (1988) was written before the establishment of Forest Service sensitive species direction (FSM 2672.4). This direction requires the Forest Service to use a biological evaluation to review all programs and activities for possible impacts to sensitive species. The Regional Forester designates species as "sensitive" because their population or habitats are trending downward, or because little information is available on their population or habitat trends. Sensitive species that may occur in the analysis area are listed in Table 3-12.

The FC-RONR Wilderness Management Plan has additional direction, not included in the Forest Plan, to protect Idaho Species of Concern: "State of Idaho Species of Concern will receive protection and management consideration complimentary to Department goals and objectives when consistent with Wilderness objectives" (FC-RONR Wilderness Management Plan, p. 29). These species are also displayed in Table 3-12.

Analysis Area

The analysis of effects to wildlife and wildlife habitats focuses on threatened, endangered, Region 4 sensitive, MIS, and Idaho Species of Concern that may occur in and adjacent to the project area that may be directly, indirectly, or cumulatively affected by the proposed activities (Table 3-12). The analysis for these species focuses on current habitat conditions, the amount of habitat modified, and disturbance from human activities. The analysis area varies depending on the wildlife species under consideration and specific management direction for those species.

A review was completed for all species listed in Table 3-12 to determine which species may occur in or adjacent to the project area. This review included the Idaho Conservation Data Center (CDC) database information, relevant publications, and consultation with knowledgeable individuals and agencies. The Idaho CDC is the central repository for information about the state's rare plant and animal populations. Based on this review, two species have a low probability of occurrence, twelve species have a medium probability of occurrence, and one species has a high probability of occurrence in or adjacent to the project area. Thirty-five other species do not have any probability of occurring in or adjacent to the project area (Table 3-12). These species are listed in the table below but will not be discussed further in this DEIS. Additional information can be found in the Wildlife Specialist Report in the Project Record.

Table 3-12. Probability of Occurrence of Threatened, Endangered, Region 4 Sensitive, MIS, and Idaho Species of Concern in and Adjacent to the Project Area (some species can be found under more than one category*).

Species	Scientific Name	Probability of Occurrence**	Habitat Suitability
Threatened Species			
Bald Eagle	*Haliaeetus leucocephalus*	None	No Habitat
Canada Lynx*	*Lynx Canadensis*	Moderate	Suitable Habitat
Northern Idaho Ground Squirrel*	*Spermophlus brunneus brunneus*	None	No Habitat
Endangered Species			

Species	Scientific Name	Probability of Occurrence**	Habitat Suitability
Gray Wolf	*Canis lupus irremotus*	High	Suitable Habitat
Region 4 Sensitive Species			
Spotted Frog*	*Rana luteiventris*	Moderate	Suitable Habitat
Fisher	*Martes pennnanti*	Moderate	Suitable Habitat
Spotted Bat*	*Euderma maculatum*	None	No Habitat
Townsend's Big-eared Bat*	*Plecotus townsendii*	Moderate	Suitable Habitat
Wolverine*	*Gulo gulo*	Moderate	Suitable Habitat
Boreal Owls*	*Aegolius funereus*	Moderate	Suitable Habitat
Columbia Sharp Tailed Grouse*	*Tympanuchus phasianellus columbianus*	None	No Habitat
Flammulated owl*	*Otus flammeolus*	None	No Habitat
Goshawk*	*Accipiter gentillis*	Moderate	Suitable Habitat
Great Gray Owl*	*Strix nebulosa*	None	No Habitat
Harlequin Duck*	*Histrionicus histrionicus*	None	No Habitat
Mountain Quail*	*Oerotyx pictus*	None	No Habitat
Three-Toed Woodpecker*	*Picoides tridactylus*	Moderate	Suitable Habitat
White-headed Woodpecker*	*Picoides albolarvatus*	None	No Habitat
Common Loon*	*Gavia immer*	None	No Habitat
Black-backed Woodpecker*	*Picoides arctious*	Moderate	Suitable Habitat
Management Indicator Species (Payette National Forest)			
Rocky Mountain Elk	*Cervus elaphus*	Moderate	Suitable Habitat
Pileated Woodpecker	*Dryocopus pileatus*	Moderate	Suitable Habitat
Williamson's Sapsucker	*Sphyrapicus thyroideus*	Moderate	Suitable Habitat
Vesper Sparrow	*Pooecetes gramineus*	None	No Habitat
White-headed Woodpecker^	*Picoides albolarvatus*	None	No Habitat
Management Indicator Species (FC-RONR Wilderness)			
Otter	*Lutra canadensis*	None	No Habitat
Blue Grouse	*Dendragapus obscurus*	Moderate	Suitable Habitat
Bighorn Sheep	*Ovis canadensis*	None	No Habitat
Mountain Goat	*Oreamnos americanus*	None	No Habitat
Common Loon*	*Gavia immer*	None	No Habitat
Black-backed Woodpecker*	*Picoides arctious*	Moderate	Suitable Habitat
Idaho Species of Concern			
Spotted Frog*	*Rana luteiventris*	Moderate	Suitable Habitat
Spotted Bat*	*Euderma maculatum*	None	No Habitat
Townsend's Big-eared Bat*	*Plecotus townsendii*	Moderate	Suitable Habitat
Wolverine*	*Gulo gulo*	Moderate	Suitable Habitat
Boreal Owls*	*Aegolius funereus*	Moderate	Suitable Habitat
Columbia Sharp Tailed Grouse*	*Tympanuchus phasianellus columbianus*	None	No Habitat
Flammulated owl*	*Otus flammeolus*	None	No Habitat
Goshawk*	*Accipiter gentillis*	Moderate	Suitable Habitat
Great Gray Owl*	*Strix nebulosa*	None	No Habitat
Harlequin Duck*	*Histrionicus histrionicus*	None	No Habitat
Mountain Quail*	*Oerotyx pictus*	None	No Habitat
Three-Toed Woodpecker*	*Picoides tridactylus*	Moderate	Suitable Habitat
White-headed Woodpecker*	*Picoides albolarvatus*	None	No Habitat
Common Loon*	*Gavia immer*	None	No Habitat
Black-backed Woodpecker*	*Picoides arctious*	Moderate	Suitable Habitat

Species	Scientific Name	Probability of Occurrence**	Habitat Suitability
Canada Lynx*	*Lynx Canadensis*	Moderate	Suitable Habitat
Northern Idaho Ground Squirrel*	*Spermophlus brunneus brunneus*	None	No Habitat
American White Pelican	*Pelecanus erythrorhynchos*	None	No Habitat
Great Egret	*Ardea alba*	None	No Habitat
Trumpeter Swan	*Cygnus buccinator*	None	No Habitat
Upland Sandpiper	*Bartramia longicauda*	None	No Habitat
Black Tern	*Vhlidonias niger*	None	No Habitat
Yellow-Billed Cuckoo	*Coccyzus americanus*	None	No Habitat
Pygmy Nuthatch	*Sitta pugmaea*	None	No Habitat
Coast Mole	*Scapanus orarius*	None	No Habitat
Fringed Myotis	*Myotis thysanodes*	None	No Habitat
Western Pipistrelle	*Pipistrellus hesperus*	None	No Habitat
Pygmy Rabbit	*Brachylagus idahoensis*	None	No Habitat
Cliff Chipmunk	*Tamias dorsalis*	None	No Habitat
Uinta Chipmunk	*Tamias umbrinus*	None	No Habitat
Rock Squirrel	*Spermophilus variegatus*	None	No Habitat
Little Pocket Mouse	*Perognathus longimermris*	None	No Habitat
Dark Kangaroo Mouse	*Microdipodops*	None	No Habitat
Northern Bog Lemming	*Synaptomys borealis*	None	No Habitat
Kit Fox	*Vulpes macrots*	None	No Habitat
Coeur D'alene Salamander	*Plethodon idahoensis*	Moderate	Suitable Habitat
Western Toad	*Bufo boreas*	None	No Habitat
Northern Leopard Frog	*Rana pipiens*	None	No Habitat
Mojave Black-Collared Lizard	*Crotaphytus bicinctores*	None	No Habitat
Ringneck Snake	*Diadophis punctatus*	None	No Habitat
Longnose Snake	*Rhinocheilus lecontei*	None	No Habitat
Ground Snake	*Sonora semiannulata*	None	No Habitat

* Species listed under multiple categories will only be addressed under one category for the Affected Environment and Environmental Consequences discussions.

** Indicates the probability of the species occurring in an area over a one-year period.

^ Not listed in the 1988 Forest Plan, but listed in the 2003 Forest Plan that is currently being revised.

Effects to the Williamson's sapsucker were analyzed within the Upper Big Creek and the Beaver-Gold watersheds (see Figure 3-12). Effects to the pileated woodpecker, a species that depends on mature forests, were analyzed based on Forest Plan direction to use theoretical pileated woodpecker home range circles. Circles 41, 45, and 46 encompass the analysis area (Figure 3-13). Effects to elk were analyzed within Elk Management Unit (EMU) #23 using the Elk Habitat Effectiveness (EHE) model (Figure 3-14). An EMU is a geographical unit that represents elk movements and home ranges. Effects to lynx and lynx habitat were analyzed for the Upper Big Creek and the Beaver-Gold Lynx Analysis Units (LAU) (Figure 3-12). These analysis areas for MIS are used by Forest Managers to estimate effects on all wildlife species on the Forest and develop management activities that meet management goals and objectives for wildlife management (Forest Plan, p. II-27).

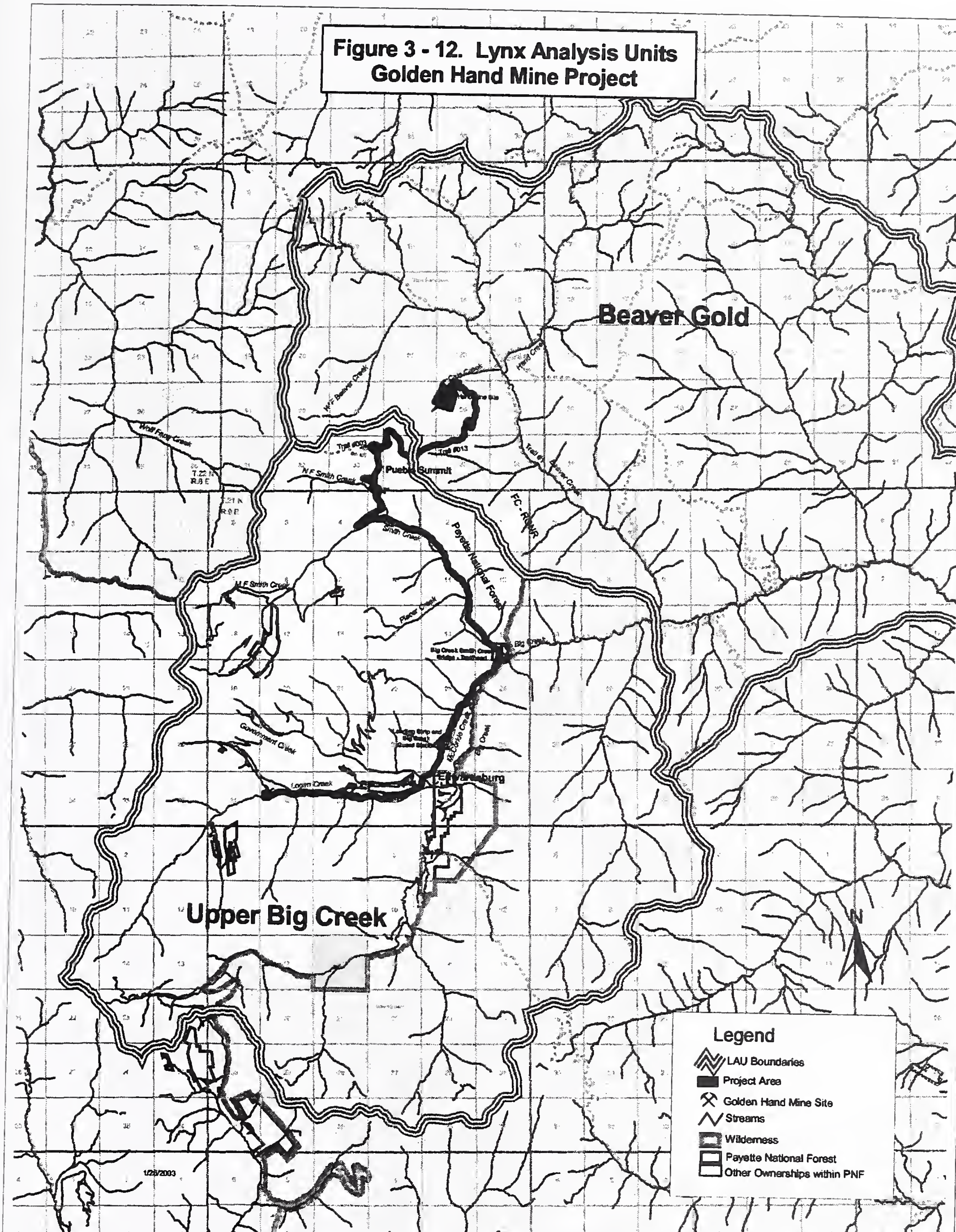


Figure 3 - 12. Lynx Analysis Units
Golden Hand Mine Project
Beaver Gold
Upper Big Creek
Pueblo Summit
Payette National Forest
Edwardsburg
Smith Creek
Placer Creek
Government Creek
Logan Creek
Big Creek
N.F. Smith Creek
M.F. Smith Creek
WF Beaver Creek
Wolf Fang Creek
Trail #013
FC - RONR
1/28/2003
Legend
LAU Boundaries
Project Area
Golden Hand Mine Site
Streams
Wilderness
Payette National Forest
Other Ownerships within PNF

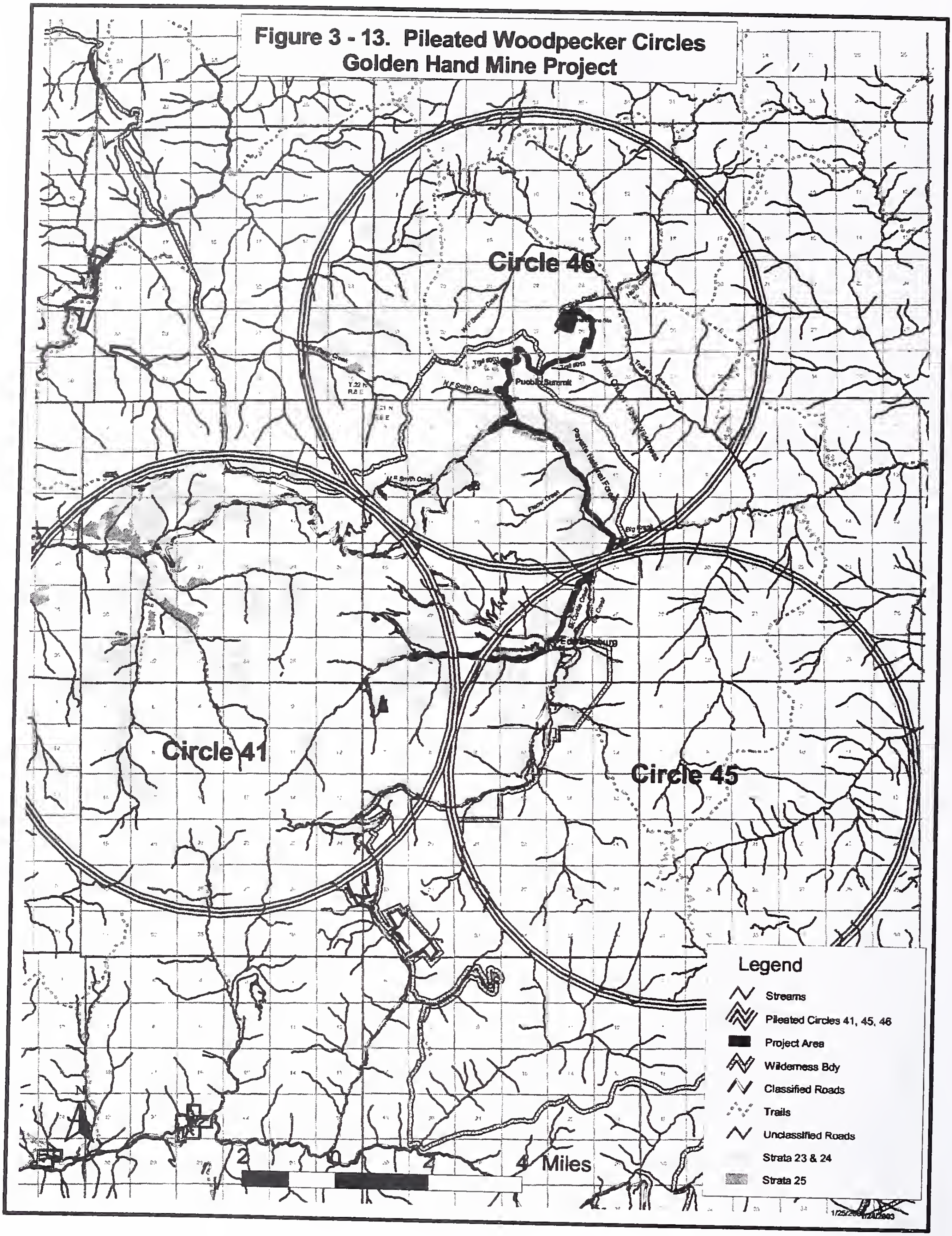
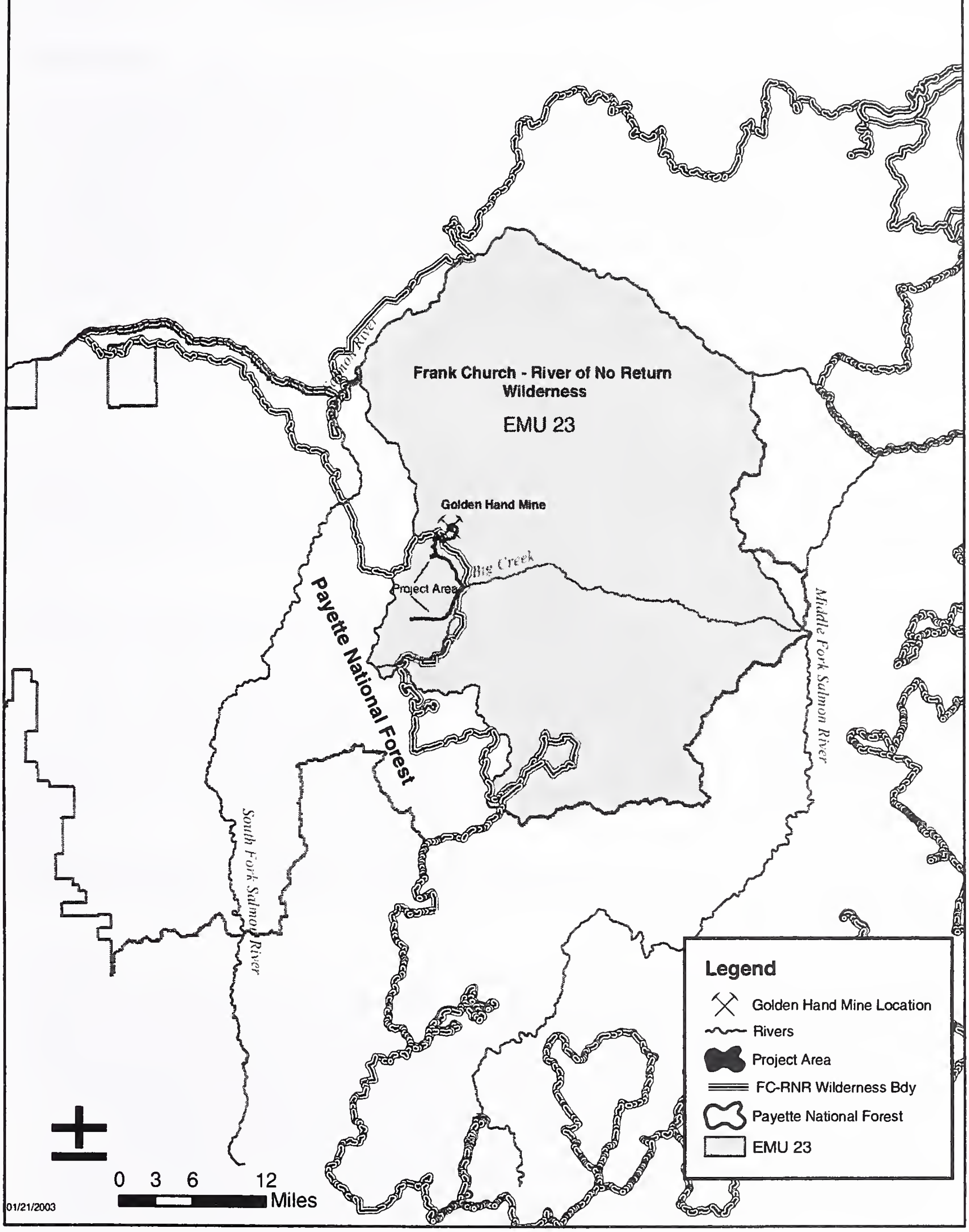


Figure 3 - 13. Pileated Woodpecker Circles
Golden Hand Mine Project
Circle 46
Circle 41
Circle 45
Pueblo Summit
Legend
Streams
Pileated Circles 41, 45, 46
Project Area
Wilderness Bdy
Classified Roads
Trails
Unclassified Roads
Strata 23 & 24
Strata 25
2
0
2
4 Miles

Figure 3 - 14. Elk Management Unit 23
Golden Hand Mine Project



Affected Environment

Past Events that have affected the Current Condition

Generally, wilderness areas are in better ecological condition than non-wilderness areas because wilderness areas have large tracts of relatively undisturbed land, which contributes to the maintenance of biological diversity and habitat connectivity. Although most of the area surrounding the claims is largely undisturbed, in the immediate vicinity of the claims there is evidence of tree harvest, soil disturbance, and road building (Project Record). Trees were removed for mining and mining-related activities that occurred primarily in the 1930s. Roads were built to the mine area in the early 1900s. Vegetation (mainly lodgepole pine and alder) has become established on many of the lesser-used roadbeds. Waste rock piles and old buildings occur on the claims. A more detailed description of past events is available in the Minerals and Geology section.

Existing Condition

Forested Vegetation

The current condition of the stands in the project area reflects a lack of active management during the past 70 years. The forest stands in the area of the claims were heavily harvested in the 1900s (Project Record). The area provides a limited range of wildlife habitat that consists mainly of lodgepole pine forest and small riparian areas.

Forested vegetation is comprised primarily of conifer trees and understory vegetation such as shrubs, forbs, and grasses. The upland areas of the claims are dominated by subalpine fir and lodgepole pine with understories of sedge, honeysuckle, beargrass, and huckleberry. Moist habitats and stream corridors are dominated by Engelmann spruce with understories of fool's huckleberry, alder, thimbleberry, and willow. Previously disturbed and compacted mining areas are vegetated with yarrow, fireweed, strawberry, and cinquefoil. Small inclusions of drier communities dominated by forbs and grasses also occur within the project area on rock outcrops and gaps in the forest canopy (TES Plants Specialist Report).

Forested vegetation can be classified by habitat types which, when grouped together, are referred to as potential vegetation groups (PVG). PVG information is available for the entire Forest including the FC-RONR Wilderness.

Stratification is another way of classifying vegetation types and is a further refinement of forest stand conditions in which stands that are relatively homogenous in age, productivity, and density are grouped together. Strata data are available for areas of the Forest outside Wilderness and provide information about forest stands using three visible criteria: crown density, tree size class, and past management. Within the Wilderness section of the project area, a visual estimate conducted by Forest timber staff determined the strata type to be Stratum 22. Stratum 22 is comprised of a harvested area with a canopy cover of about 50%, with an immature to mature timber component. Outside the Wilderness, adjacent to FR 371 and 373 are stands classified as Strata 23, 24, and 42 (see Figure 3-13). Stratum 23 consists of mature to overmature, dense, multi-storied stands that often exhibit old growth characteristics. Stratum 24 is similar to 23, but

the canopy cover is less dense. Stratum 42 is generally mature to overmature with an open canopy cover.

Threatened and Endangered Species

Canada Lynx

The Canada lynx (lynx) is a threatened species that is associated with high elevation (above 5,000 feet) boreal spruce-subalpine fir and lodgepole pine forests. It forages on snowshoe hares, mice, voles, squirrels, and birds. Lynx are not common in Idaho, and are primarily restricted to northern Idaho. Primary foraging habitat occurs in young lodgepole pine stands where the lynx prey on snowshoe hare. Denning habitat is mature spruce and subalpine fir forest with extensive downfalls. Suitable habitat for this species is found in and adjacent to the project area.

Lynx habitat on the Payette National Forest was described using criteria in the *Canada Lynx Conservation Assessment and Strategy* (LCAS) (August 2000), and cover type association mapping. Lynx habitat was mapped for this project using LCAS habitat descriptions. Potential habitat was identified using Land-sat data and then refined at the project level using strata and working group data where available.

The LCAS states "if more than 30 percent of lynx habitat within a Lynx Analysis Unit (LAU) is currently in unsuitable condition, no further reduction of suitable conditions shall occur as a result of vegetation management activities by federal agencies (p. 7-3)." It also states, "if more than 15% of the potential habitat has been made unsuitable then no further treatment can occur".

The project area lies within the Upper Big Creek and Beaver-Gold LAUs (Figure 3-12). Approximately 83 percent of the Upper Big Creek LAU, and 76 percent of the Beaver Gold LAU have been identified as potential lynx habitat (Table 3-13).

Table 3-13. Potential Lynx Habitat the Upper Big Creek and Beaver Gold LAUs

LAUs in the Analysis Area	LAU Acres	Potential Lynx Habitat		Suitable Habitat		% of LAU treated in last 10 years
		Acres	%	Acres	%	
Beaver Gold	60,156	45,329	76	unknown		0
Upper Big Creek	61,611	50,639	83	19,957	40	0

Gray Wolf

The gray wolf once occupied many areas in North America. In the northern Rocky Mountains, the gray wolf is found in a few remnant populations along the Canadian-United Sates border. Transient lone wolves are known to occur in Idaho. The entire area of central Idaho is potential habitat for gray wolves as large populations of elk and deer are present. The 1987 Northern Rocky Mountain Gray Wolf Recovery Plan identifies central Idaho as a recovery area for gray wolves. Population objectives are provided in the recovery plan (USDA and Fish and Wildlife Service 1987). Gray wolves are an endangered species now being managed as a non-essential experimental population in central Idaho by the Nez Perce Tribe under the authority of the U.S. Fish and Wildlife Service (USFWS 1994, USFWS 1995, Nez Perce Tribe 1995).

Wolves are wide-ranging predators that can occupy nearly any place in central Idaho where big game populations occur. In summer months this would include nearly all habitats and elevations. Thirty-five wolves from Canada have been transplanted to the FC-RONR Wilderness. Suitable habitat for this species is found in and adjacent to the project area.

Region 4 Sensitive Species

Spotted Frog

The spotted frog has a wide distribution in northern and central Idaho and surrounding states. Locally, the spotted frog has been observed from the headwaters of the Weiser River on the west side of the Payette National Forest to Big Creek on the east side of the Forest (Jeffries, pers. comm. 2002). While breeding, spotted frogs can be found near permanent water such as marshy edges of ponds or lakes, in algae-grown overflow pools of streams, or near springs with emergent vegetation. They can move considerable distances from water after breeding, often frequenting mixed conifer and sub-alpine forest, grasslands, and brush lands of sage and rabbit brush (Nussbaum et al. 1983). Spotted frogs are thought to hibernate in holes near springs or other areas where water is not frozen and is constantly renewed. The wetlands in or adjacent to the project area are suitable habitat for the spotted frog.

Fisher

Fishers were nearly extinct in Idaho by the 1930s, but were reintroduced throughout the State. These introductions were very successful, and fishers are now becoming more common and widely distributed. Fishers in north-central Idaho primarily use mature and old growth forest habitats during summer, and a combination of young and old growth forest habitats in winter (Ruggiero et al. 1994). They also use forested riparian habitats in the summer and winter, traveling along the stream corridors. Home ranges are approximately 80 square kilometers for males, and 40 square kilometers for females. Fishers prefer large-diameter Engelmann spruce trees and hollow grand fir logs for resting sites. Grand fir habitat types are most preferred, especially the wetter types. The closest reported observation of a fisher to the project area is 10 miles south (Idaho CDC database, 2002). No fisher or fisher sign was observed in the project area during general wildlife surveys, but suitable habitat exists.

Townsend's Big-eared Bat

Townsend's big-eared bat occurs throughout western North America from British Columbia to southern Mexico. Big-eared bats use juniper/pine forests, shrub/steppe grasslands, deciduous forests, and mixed conifer forests from sea level to 10,000 feet elevation (Spahr et al. 1991). During winter they roost singly or in small clusters in caves, mine shafts, at rocky outcrops, or in old buildings. They remain at these roost sites, referred to as hibernacula, from October to February. They hang from ceilings with their ears curled in ram's horn fashion, possibly to help prevent hearing loss (Spahr et al. 1991). They do not migrate, but will move to different hibernacula during the winter. These movements are thought to be in response to temperature changes. In the summer, females roost with their young in nursery roosts. Males and non-breeding females roost alone.

Surveys for these bats were conducted in the project area in August 2002. Three adits were surveyed; no Townsend's big-eared bats were observed, however, suitable habitat was found in the adit that is located in the Glory Hole inferred ore deposit (see Figure 2-1, Chapter 2).

Wolverine

The wolverine is a wide-ranging species throughout the mountains of Idaho. It has documented movements of up to 378 kilometers in Alaska (Groves 1987). The highest number of wolverine observations in Idaho is in the Sawtooth Mountains, where recent studies have confirmed the presence of a wolverine population (Bachman et al. 1990). There are no recorded sightings of wolverine in or around the project area (Idaho CDC 2002) and no wolverine sign was found during the general wildlife surveys of the project area, however, there is suitable habitat. On the Challis and Sawtooth National Forests, wolverines were found principally in mixed conifer habitats dominated by lodgepole pine. They used spruce-fir stands along stream bottoms and adjacent meadows (Bachman et al. 1990). Elevations ranged from 5,800 to 7,800 feet in winter, and would likely be higher in the summer.

Boreal Owl

Boreal owls are closely associated with high elevation spruce-fir forests. Nesting habitat structure consists of forests with a relatively high-density of large trees (12 inches or more in diameter), open understory, and multi-layered canopy (Hayward 1988). Owls nest in cavities excavated by large woodpeckers in mixed coniferous, aspen, Douglas fir, and spruce-fir habitat types. In summer, owls roost in cool spruce-fir stands. In winter, they may move to lower elevations and roost in protected forested areas. Boreal owls roost close to the bole of the tree, probably for both security and thermoregulation (Stephans and Struts 1991). Boreal owls avoid open areas such as clearcuts and open meadows, except for occasional use of the edges of openings for foraging. The CDC database (2002) has no records of boreal owl sightings in the project area, but suitable habitat for this species is found in the area.

Goshawk

The goshawk is a habitat generalist that uses a wide variety of forest types and conditions (USDA Forest Service 1991). The presence of prey species may determine habitat use. Goshawk home ranges are about 6,000 acres and have been divided into three components: 1) a nest site core area, 2) a post-fledgling/family area, and 3) a foraging area (USDA Forest Service 1991). Of these, the nest area is the most habitat specific. Nest areas require about a 30-acre stand of large old trees with a dense canopy cover. Most goshawks have two to four alternate nest areas within their home range. The post-fledgling/family area and foraging area can consist of a wide variety of habitats as long as prey is abundant. Goshawks may forage over the project area.

Three-toed Woodpecker

Three toed woodpeckers are found in northern coniferous and mixed forest types up to 9,000 feet elevation. Forests containing spruce, grand fir, ponderosa pine, tamarack, and lodgepole pine are used. These woodpeckers are closely associated with lodgepole pine and spruce, often-in mixed conifer stands (Bull et al. 1986). This woodpecker opportunistically uses areas that have high

levels of wood-boring insect outbreak and burned over areas where trees have recently died. Three-toed woodpeckers feed by scaling off the bark of dead and dying trees, resulting in a pile of bark at the base of the tree (Spahr et al. 1991).

Black-backed Woodpecker

This woodpecker usually inhabits high elevation spruce/fir forest especially those with windfall, burned areas, and numerous standing dead trees. The black-backed woodpecker can also be found in swamps and mixed deciduous/coniferous forests usually above 3,000 feet. In the winter it will inhabit lower elevation coniferous forests below 3,000 feet. The black-backed woodpecker feeds almost exclusively on the larvae of wood-boring beetles and may consume over 13,000 annually (Enrlich et al. 1988). It forages in burned areas and its black back may serve as a form of camouflage when feeding in these denuded areas. The breeding biology of this woodpecker is not well known although it seems to prefer fir trees with a cavity below a branch. Nest cavities are generally constructed each year as a means to control parasites and avoid nest predators.

Management Indicator Species

Rocky Mountain Elk (Elk)

Elk are an indicator of general forest habitats that provide adequate hiding and thermal cover. On the Payette National Forest, elk habitat is measured using the Elk Habitat Effectiveness (EHE) model. EHE is a weighted numeric rating with a 0 to 100 value range that describes elk habitat quality based on road density, road impacts, the ratio of forage to cover, and the juxtaposition of forage and cover on the landscape. The Forest Plan establishes target EHE values, which includes buffers around key big game travel routes; key elk wallows; new openings and meadows greater than five acres; and limits newly created openings to 40 acres (pp. IV-30, 34). The analysis area for this project is found in Elk Management Unit (EMU) 23 (Figure 3-14). The current EHE value for this unit is 86; the target rating for this EMU is 70. Calving and fawning areas are protected from disturbance during the period of time they are used (usually between May 1 and July 15) (p. IV-30). No key elk habitat components, such as wallows and calving areas, were observed within or adjacent to the project area.

Pileated Woodpecker

This woodpecker is the largest western forest woodpecker that uses mixed conifer forest with large diameter trees for nesting, and uses decaying wood for foraging. Pileated woodpeckers create cavities that are used by animals incapable of excavating their own nesting or roosting cavities such as flammulated and boreal owls. The Forest Plan designated this woodpecker as an indicator of old growth forests. During Forest planning, a process was developed to maintain the habitat required to ensure population viability of the pileated woodpecker across the Forest. Sixty-one "pileated circles", each ten miles in diameter, were laid evenly across the Forest. A ten-mile diameter was selected as it is the theoretical maximum dispersal distance between home ranges. Pileated circles #41, 45, and 46 intersect the Golden Hand Mine project area (Figure 3-13). The Forest Plan (p. IV-34) requires a minimum of 5 percent of forested acres within each circle be maintained as mature and old growth timber. The Payette National Forest defines mature timber as larger diameter individuals generally between 120 to 250 years old. The Forest

Plan also requires at least 2.5 percent of this mature and old growth forest to meet Thomas's (1979) definition of old growth. Table 3-14 displays predicted mature and old growth forest in each circle.

The amount of mature and old growth forest in each of the pileated woodpecker circles exceeds the Forest Plan requirements (5 and 2.5 percent respectively) (Table 3-14). In addition, no old growth occurs in the immediate vicinity of the mine site. Due to past activities in the vicinity of the mining claims, most of the trees in the area are less than 100 years old and the stands do not quality as mature timber.

Table 3-14. Percent Old Growth and Mature Forest of Stratified Acres in the Pileated Woodpecker Circle

Indicator	Pileated Woodpecker Circle #41		Pileated Woodpecker Circle #45		Pileated Woodpecker Circle #46	
	acres	%	acres	%	acres	%
Total area of circle	50,006		50,006		50,006	
Area of circle with strata information	49,414	99	6,845	14	22,422	45
Mature and overmature forest for area of circle with strata info. (strata 23, 24, 25, and 26)	8,516	17	1,810	26	4,404	20
Old growth forest for circle with strata info. (strata 23 and 24)	7,557	15	1,747	26	4,260	19
Mature and overmature forest for total circle*	8,516	17	1,810	4	4,404	9
Old growth forest for total circle*	7,557	15	1,747	4	4,260	9

* Minimum amount of mature and overmature forest for total circle

Williamson's Sapsucker

This species uses dense, mature mixed coniferous and deciduous forests. They use dead or live trees infected with heart rot fungi for nest sites. The Williamson's sapsucker is used as an indicator for cavity-dependent species that prefer mature forests (p. II-28). The Forest Plan provides management direction for cavity-dependent species that includes recommendations for retention of snags and coarse woody debris (p. IV-29).

Blue Grouse

The blue grouse occupy a fairly vertical range in the western mountains, breeding at lower elevations in open stands of conifers or aspens with a brush understory; in meadows; or adjacent to aspens or conifers in stands of mixed brush and herbs interspersed with bare ground. During mating season, males display in relatively open stands of trees or shrubs on earth mounds, rocks, logs, cutbanks, and occasionally tree limbs. During autumn, this species moves up from the open breeding range.

Idaho Species of Concern

Additional descriptions of Idaho Species of Concern that have a probability of occurring in the project area (spotted frog, Townsend's big-eared bat, wolverine, boreal owls, goshawk, great gray owl, three-toed woodpecker, and black-backed woodpecker) can be found above under Region 4 sensitive species.

Coeur D'Alene Salamander

This species inhabits four types of habitat: springs, seeps, spray zones of waterfalls, and edges of streams. It is often associated with fractured rock formations. Suitable habitat for this species is found within the project area.

Migratory Birds

In 2001, Executive Order 13186 *Responsibilities of Federal Agencies to Protect Migratory Birds*, was signed. This order requires environmental analyses of federal actions to evaluate the effects on migratory birds, with emphasis on species of concern. The Fish and Wildlife Service and Region 4 of the Forest Service agreed to use State Bird Conservation Plans as tools to identify relevant migratory bird species and habitat for project analysis.

In January 2000, the Idaho Partner in Flight program published the Idaho Bird Conservation Plan. The Idaho Bird Conservation Plan identified four high priority habitats in Idaho: riparian, non-riverine wetlands, sagebrush scrublands, and dry ponderosa pine/Douglas fir/grand fir forest. The riparian habitats identified are broad valley bottoms and narrow valley bottoms of low to mid elevations. None of these priority habitats are found within or near the project area. For this reason, effects to migratory birds (except those listed as threatened, endangered, Region 4 sensitive, MIS, or Idaho Species of Concern that have a probability of occurring in the project area) will not be discussed in this document.

Environmental Effects

This section discloses the amount of habitat modified and the effects of human activity on threatened and endangered species, Region 4 sensitive species, Management Indicator Species (MIS), and Idaho Species of Concern.

to threatened, endangered, Region 4 Sensitive, MIS, and Idaho Species of Concern is based on information from: the Idaho Department of Fish and Game, Idaho CDC (2002), U.S. Fish and Wildlife Service, wildlife field inventories, plant inventories, published studies on wildlife habitat relationships, wildlife distribution monographs, elk habitat relationship modeling, and the use of professional judgment by the project wildlife biologist.

Disturbance created by the sounds and sights of mining and mining-related activities would have some negative effects on all species considered in this analysis. Most disturbances would result in temporary displacement to other areas within or near the project area. These effects would last for the duration of the project.

Threatened and Endangered Species

Gray Wolf

Direct and Indirect Effects - There would be no direct or indirect effects to the gray wolf as the result of Alternative A. No habitat modification would occur.

All action alternatives would have the same direct and indirect effects to the gray wolf. The action alternatives would not result in any measurable changes to wolf habitat, but disturbance during project activities (human presence, project noise, vehicles) could displace wolves from the project area. These effects would be temporary, and wolves would be expected to return after the project is completed. Alternative B would allow operation for up to 10 years, and C and D for only 5 years. Displacement would occur for a longer time in Alternative B than Alternatives C and D.

Cumulative Effects - No measurable contribution to cumulative effects is expected because only limited displacement would occur around the mine site and few other activities that would displace wolves are expected to occur in the area (Appendix A).

Species Viability - The gray wolf is covered by recovery plans as previously noted. These plans address viability of the species throughout its range and provide guidelines to return the species to sustained viability; none of the alternatives would compromise that effort.

Determination - Based on the above discussion of direct, indirect, and cumulative effects, the project wildlife biologist has determined that Alternatives B, C, and D may affect, but would not jeopardize, the continued existence of the gray wolf.

Rationale for Effect Determination - Wolf habitat would not be affected by any of the alternatives. Wolves may be displaced under the action alternatives, but this displacement would only be temporary, and wolves would be expected to return after project activities were completed.

Lynx

Direct and Indirect Effects - There would be no direct or indirect effects to lynx or lynx habitat as a result of Alternative A.

Alternatives B, C, and D would have the same direct and indirect effects to lynx. None of the action alternatives would modify lynx habitat. There are no actions proposed that would alter stand structure or tree species composition. Disturbance during project activities could displace lynx from the analysis area. These effects would be temporary, and lynx would be expected to return after the project is completed. Alternative B would allow operation for up to 10 years and C and D for only 5 years. Displacement would occur for a longer time in Alternative B than Alternatives C and D.

Cumulative Effects - No measurable contribution to cumulative effects is expected because only limited displacement would occur around the mine site and few other activities that would displace lynx are expected to occur in the area (Appendix A).

Determination - Based on the above discussion of direct, indirect, and cumulative effects the project wildlife biologist has determined that Alternatives B, C, and D may affect, but are not likely to adversely affect, the Canada lynx.

Rationale for Effect Determination - Lynx habitat would not be affected by any of the alternatives. Lynx may be displaced under the action alternatives, but this displacement would only be temporary and lynx would be expected to return after project activities are completed.

Region 4 Sensitive Species

Spotted Frog

Direct and Indirect Effects - There would be no direct or indirect effects to the spotted frog as a result of Alternative A. No habitat modification would occur.

Under Alternatives B, C, or D, it is unlikely that proposed activities would negatively affect spotted frog habitat in the project area. Under Alternative B, there would be two new stream crossings in the area of the claims, but impacts to wetlands would be minimal. Under Alternatives C and D, riparian areas would be buffered from activities, so there would be no impacts to wetlands under these alternatives.

Cumulative Effects - No measurable contribution to cumulative effects is expected, because impacts to wetlands from the activities proposed under the alternatives would be minimal (Appendix A).

Determination of Effects -Based on the above discussion of direct, indirect, and cumulative effects the wildlife biologist has determined that proposed activities may impact individuals or habitat, but would not likely contribute to a trend toward federal listing or loss of viability to the population or species.

Rationale for Effect Determination - Spotted frog habitat may be affected by project activities in Alternative B but effects would be minimal. No impacts to spotted frog habitat are expected in Alternatives C or D.

Fisher

Direct and Indirect Effects -There would be no direct or indirect effects to the fisher as a result of Alternative A. No habitat modification would occur.

Under Alternatives B, C, and D, the primary effects on fisher habitat would be from human disturbance. The presence of humans and the associated activities in the project area would reduce the likelihood that fishers would inhabit the project area during mine operation. These effects would be temporary and any fishers that may occur in the vicinity would be expected to return after the project is completed. Since Alternative B would allow operation for up to 10 years and C and D for only 5 years, displacement would occur for a longer time in alternative B than Alternative C and D.

Cumulative Effects - No measurable contribution to cumulative effects is expected because only limited displacement would occur around the mine site and few other activities that would displace fishers are expected to occur in the area (Appendix A).

Determination of Effects - Alternatives B, C, or D may impact individuals or habitat, but would not likely contribute to a trend toward federal listing or loss of viability to the population or species, or its habitat.

Rationale for Effect Determination - Fisher habitat would not be affected by any of the alternatives. Fishers may be displaced under the action alternatives, but this displacement would only be temporary and fishers would be expected to return after project activities are completed.

Townsend's Big-eared Bat

Direct and Indirect Effects - Under Alternative A there would be no direct or indirect effects to the Townsend's big-eared bat. No habitat modification would occur. Under the action alternatives, habitat for Townsend's big-eared bats could be affected by blasting and drilling in the adits. Mining activities within the claim areas and specifically in the adits would displace the bats. Effects would be temporary, and the bats would be expected to return after the project is completed. Displacement under Alternative B would occur for a longer amount of time (up to 10 years) than Alternatives C and D (up to 5 years).

Cumulative Effects - No measurable contribution to cumulative effects is expected because only limited displacement would occur around the mine site and few other activities that would displace bats are expected to occur in the area (Appendix A).

Determination of Effects - Alternatives B, C, and D may impact individuals or habitat, but would not likely contribute to a trend toward federal listing or loss of viability to the population or species, or its habitat.

Rationale for Effect Determination - Townsend's big-eared bat habitat may be affected by Alternatives B, C, and D. Bats would be displaced by mining activities, but this displacement would only be temporary and bats would be expected to return after project completion.

Wolverine

Direct and Indirect Effects - There would be no direct or indirect effects to wolverine as a result of Alternative A. No habitat modification would occur.

The primary effects of Alternatives B, C, and D on wolverine habitat would be disturbance from human presence. During the project, mining activities would reduce the likelihood that wolverines would occur in the project area, but wolverines would be expected to return after project completion. Under Alternative B, displacement would be longer (up to10 years) than Alternatives C and D (up to 5 years).

Cumulative Effects - No measurable contribution to cumulative effects is expected because only limited displacement would occur around the mine site and few other activities that would displace wolverines are expected to occur in the area (Appendix A).

Determination of Effects - Alternatives B, C, and D may impact individuals or habitat, but would not likely contribute to a trend toward federal listing or loss of viability to the population or species, or its habitat.

Rationale for Effect Determination - Wolverine habitat would not be affected by any of the alternatives. Wolverine may be displaced under the action alternatives, but this displacement would only be temporary, and wolverines would be expected to return after project activities are completed. Under Alternative B displacement would be longer (up to 10 years) than Alternatives C and D (up to 5 years).

Boreal Owl

Direct and Indirect Effects - Under Alternative A there would be no direct or indirect effects to boreal owls. No habitat modification would occur.

Under Alternatives B, C, and D, the primary effects on boreal owl habitat would be from human disturbance. The presence of humans and the associated activities in the project area would reduce the likelihood that boreal owls would inhabit the project area during mine operation. These effects would be temporary, and any boreal owls that may occur in the vicinity would be expected to return after the project is completed. Alternative B would displace the boreal owls for up to 10 years, while Alternatives C and D would cause displacement for up to 5 years.

Cumulative Effects – No measurable contribution to cumulative effects is expected because only limited displacement would occur around the mine site and few other activities that would displace boreal owls are expected to occur in the area (Appendix A).

Determination of Effects - Alternatives B, C, and D may impact individuals or habitat, but would not likely contribute to a trend toward federal listing or loss of viability to the population or species, or its habitat.

Rationale for Effect Determination – Boreal owl habitat would not be affected by any of the alternatives. Boreal owls may be displaced under the action alternatives, but this displacement would only be temporary, and boreal owls would be expected to return after project activities are completed.

Northern Goshawk

Direct and Indirect Effects - There would be no direct or indirect effects to goshawks as a result of Alternative A. No habitat modification would occur.

Under Alternatives B, C, and D the primary effects to goshawk habitat would be from human disturbance. The presence of humans and the associated activities in the project area would reduce the likelihood that goshawks would inhabit the project area during mine operation. These effects would be temporary, and any goshawk that may occur in the vicinity would be expected to return after the project is completed. Displacement under Alternative B would occur for a longer amount of time (up to 10 years) than Alternatives C and D (up to 5 years).

Cumulative Effects – No measurable contribution to cumulative effects is expected because only limited displacement would occur around the mine site and few other activities that would displace goshawks are expected to occur in the area (Appendix A).

Determination of Effects - Alternatives B, C, and D may impact individuals or habitat, but would not likely contribute to a trend toward federal listing or loss of viability to the population or species, or its habitat.

Rationale for Effect Determination – Goshawk habitat would not be affected by any of the alternatives. Goshawks may be displaced under the action alternatives, but this displacement would only be temporary and goshawks would be expected to return after project activities are completed.

Three-toed Woodpecker

Direct and Indirect Effects- There would be no direct or indirect effects to the three-toed woodpecker as a result of Alternative A. No habitat modification would occur.

The effects of Alternatives B, C, and D on three-toed woodpecker habitat would be mining-related disturbance in the project area. Project activities would reduce the likelihood that three-toed woodpeckers would occur in the project area during mining activities, but woodpeckers would be expected to return after the project is completed. Displacement under Alternative B would occur for a longer amount of time (up to 10 years) than Alternatives C and D (up to 5 years).

Cumulative Effects – No measurable contribution to cumulative effects is expected because only limited displacement would occur around the mine site and few other activities that would displace woodpeckers are expected to occur in the area (Appendix A).

Determination of Effects - Alternatives B, C, and D may impact individuals or habitat, but would not likely contribute to a trend toward federal listing or loss of viability to the population or species, or its habitat.

Rationale for Effect Determination – Three-toed woodpeckers would not be affected by any of the alternatives. Three-toed woodpeckers may be displaced under the action alternatives, but this displacement would only be temporary and three-toed woodpeckers would be expected to return after project activities are completed.

Black-Backed Woodpecker

Direct and Indirect Effects- There would be no direct or indirect effects to the black-backed woodpecker as a result of Alternative A. No habitat modification would occur.

The effects of Alternatives B, C, and D on black-backed woodpecker habitat would be mining-related disturbance in the project area. Project activities would reduce the likelihood that black-backed woodpeckers would occur in the project area during mining activities, but would be expected to return after the project is completed. Displacement under Alternative B would occur for a longer amount of time (up to 10 years) than Alternatives C and D (up to 5 years).

Cumulative Effects – No measurable contribution to cumulative effects is expected because only limited displacement would occur around the mine site and few other activities that would displace woodpeckers are expected to occur in the area (Appendix A).

Determination of Effects - Alternatives B, C, or D may impact individuals or habitat, but would not likely contribute to a trend toward federal listing or loss of viability to the population or species, or its habitat.

Rationale for Effect Determination – Black-backed woodpeckers would not be affected by any of the alternatives. Black-backed woodpeckers may be displaced under the action alternatives, but this displacement would only be temporary, and black-backed woodpeckers would be expected to return after project activities were completed. Displacement under Alternative B would occur for a longer amount of time (up to 10 years) than Alternatives C and D (up to 5 years).

Management Indicator Species

Rocky Mountain Elk

Direct and Indirect Effects: The Forest Plan target rating for Elk Management Unit (EMU) 23 is an Elk Habitat Effectiveness (EHE) value of 70. The current EHE value is 86. The action alternatives would not impact enough habitat to change the EHE rating. The current road density is 0.07 mile of open road per square mile. Under Alternative B, 4.0 miles of road would be constructed; under Alternative C, 3.4 miles would be constructed, while in Alternative D, there would be no roads constructed. This increase in road miles under Alternatives B and C is not enough to affect road density in EMU 23, which is 733,026 acres. The road density across the EMU for all alternatives would not change. The current EHE rating of 86 would remain the same.

The presence of humans and the associated activities in the project area would reduce the likelihood that elk would inhabit the project area during mine operation. These effects would be temporary, and elk that may occur in the vicinity would be expected to return after the project is

completed. Alternative B would displace the elk for up to 10 years, while Alternatives C and D would cause displacement for up to 5 years.

Cumulative Effects: No measurable contribution to cumulative effects is expected because the road density across the EMU and the EHE for all alternatives would not change. Only very limited displacement of elk would occur around the mine site. This displacement would not measurably contribute to other activities in the area, specifically hunting, that may displace or reduce elk in the area (Appendix A).

Pileated Woodpecker and Williamson's Sapsucker

Direct and Indirect Effects: Effects on habitat for these species would be very similar; they both require old and mature forest with snags and downed logs for nesting and foraging. Under Alternative A there would be no direct or indirect effects on pileated woodpecker or Williamson's sapsucker habitat.

Alternatives B, C, and D would have little to no effects on stand structure. Old growth condition would not be affected and would continue to meet the Forest Plan requirements. There would be no effects to pileated woodpecker habitat or Williamson's sapsucker habitat.

The presence of humans and the associated activities in the project area would reduce the likelihood that pileated woodpeckers or Williamson's sapsuckers would inhabit the project area during mining operations. These effects would be temporary, and any pileated woodpeckers and Williamson's sapsuckers that may occur in the vicinity would be expected to return after the project is completed. Alternative B would displace pileated woodpeckers or Williamson's sapsuckers for up to 10 years, while Alternatives C and D would cause displacement for up to 5 years.

Cumulative Effects: No measurable contribution to cumulative effects is expected because the action alternatives would have essentially no effect on stand structure or old growth condition. Only limited displacement of these species would occur around the mine site. This displacement would not measurably contribute to other activities in the area, specifically firewood harvest that may reduce woodpecker habitat in the area (Appendix A).

Blue Grouse

Direct and Indirect Effects: Under Alternative A there would be no direct or indirect effects to blue grouse habitat. Alternatives B, C, and D would have little to no effect on stand structure or blue grouse habitat.

The presence of humans and the associated activities in the project area would reduce the likelihood that blue grouse would inhabit the project area during mine operation. These effects would be temporary and any blue grouse that may occur in the vicinity would be expected to return after the project is completed. Alternative B would displace the blue grouse for up to 10 years, while Alternatives C and D would cause displacement for up to 5 years.

Cumulative Effects: No measurable contribution to cumulative effects is expected because the action alternatives would have essentially no effect on blue grouse habitat. Only very limited displacement of blue grouse may would occur around the mine site and would not measurably

contribute to other activities in the area that may affect blue grouse habitat in the area (Appendix A).

Idaho Species of Concern

Coeur D'Alene Salamander

Direct and Indirect Effects: There would be no direct or indirect effects to the Coeur D'Alene salamander as a result of Alternative A. No habitat modification would occur.

It is unlikely that proposed activities under Alternatives B, C, and D would negatively affect Coeur D'Alene salamander habitat in the project area. Under Alternative B, the road construction in the Wilderness would have minimal impacts to wetlands and streams. Under Alternatives C and D, riparian areas would be buffered from activities, so there would be no impacts to wetlands. In addition, for Alternative D there would be no road construction, so there would be no stream crossings and no impacts to wetlands.

Cumulative Effects: No measurable contribution to cumulative effects is expected because impacts to wetlands from the activities proposed under the alternatives would be minimal. Only very limited displacement of blue grouse would occur around the mine site and would not measurably contribute to other activities in the area that may affect blue grouse habitat in the area (Appendix A).

Disclosure Statement for compliance with the Migratory Bird Treaty Act (MBTA) and Executive Order 13186

This project may result in an unintentional take of individuals; however, the project complies with the Fish and Wildlife Service Director Order # 131 and requirements for permit to "take". In addition, this project complies with Executive Order 13186 since the analysis meets Forest Service requirements as defined under the January 16, 2001 Memorandum of Agreement (MOA) between the USDA-Forest Service and the USDI-Fish and Wildlife Service. The actions expected under this MOA will be a precursor to help form more specific protocol that will be developed in a subsequent interagency MOA(s), pursuant to the Executive Order. The purpose of this MOA is to strengthen migratory bird conservation though enhanced collaboration between the Forest Service and Fish and Wildlife Service in coordination with state, Tribal, and local governments.

Irreversible and Irretrievable Commitments

No irreversible or irretrievable commitments of wildlife or wildlife habitat would occur under Alternatives A, C, and D. Some mature and overmature trees would be lost under Alternative B. The loss would be irretrievable for 100 to 300 years.

Payette National Forest Management Plan and FC-RONR Wilderness Management Plan Consistency

All alternatives would be consistent with Forest Plan direction because a variety and diversity of habitat would continue to be provided throughout the Forest to support viable populations of all

native vertebrate species (Forest Plan, p. IV-25). Effects to threatened, endangered, and proposed species (TEPS), Region 4 sensitive species, Management Indicator Species (MIS), and Idaho Species of Concern from all action alternatives were analyzed and found to be negligible.

Specialist Report

This DEIS hereby incorporates by reference the Wildlife Resources Specialist Report in the Project Record (40 CFR 1502.21). The Wildlife Resources Specialist Report is located in Section 5(8) of the Project Record and contains the detailed data, methodologies, analyses, conclusions, maps, references, and technical documentation that the wildlife biologist relied upon to reach the conclusions in this DEIS.

Noxious Weeds

Scope of the Analysis

Issue #9: The effects of the proposed activities on noxious weed establishment and spread in and adjacent to the project area.

Indicators

- Establishment and spread of noxious weeds

Background

The Federal Noxious Weed Act of 1974, as amended, provides for the control and management of noxious weeds defined as "a plant which is of foreign origin, is new to, or is not widely prevalent in the United States, and can directly or indirectly injure crops, other useful plants, livestock, or the fish and wildlife resources of the United States or the public health" (U.S. Congress, Public Law 93-629). Noxious weeds have the ability to out-compete native vegetation and can change ecosystem conditions and processes. Forage values, plant species diversity, and soil stability decrease when noxious weeds become established (USDA 1999). Noxious weeds and seeds are transported and dispersed by gravel hauling, vehicles, animals, and wind. Ground disturbing activities can promote the spread of weeds by providing a seedbed in which to establish. Roads, trails, and rivers have been identified as the primary conduits for noxious weed species transport and establishment (USDA 1999).

Major Comments: Comments received from the public, agencies, organizations, and Tribal Governments focused on concerns with noxious weed establishment and spread in the Wilderness. Recommendations included washing vehicles prior to entering the Wilderness, reseeding disturbed areas with native plants, and using certified weed-free feed for packstock. Additional information on public comments is available in Chapter 4.

Management Direction

The Forest Plan (1988, as amended) includes standards and guidelines for managing noxious weeds (pp. IV-44 to 45). The direction proposed in the Payette National Forest Plan that is currently being revised contains some of the best available management guidelines for the containment and control of noxious weeds. Standards include "Re-vegetate areas…where the soil has been exposed by ground-disturbing activity", and "Earth-disturbing equipment used on National Forest System lands…shall be cleaned to remove all visible plant parts, dirt, and material that carry noxious weed seeds." In addition, it states "Materials such as hay, straw, or mulch that are used for rehabilitation and reclamation activities shall be free of noxious weed seed, and shall comply with the 1995 weed-free forage special order against use of non-certified hay, straw, or mulch".

Forest Service policy for noxious weed management includes "…cooperate with other federal, state, and local entities and the public in implementation of noxious weed management program

on National Forest System (NFS) lands to control and contain the spread of noxious weeds" (FSM 2080). Forest Service policy direction for Wilderness is to maintain Wilderness in such a manner that ecosystems are unaffected by human manipulation and influences so that plants and animals develop and respond to natural forces (FSM 2320.2). The National Forest Noxious Weed Management Policy (FSM 2080-2083) requires National Forests to prevent the introduction and establishment and provide for the containment and suppression of noxious weeds, and to cooperate with state agencies.

The Frank Church-River of No Return (FC-RONR) Wilderness Management Plan includes direction for seeding that states "Native or naturalized plant species are required in accomplishing authorized seedings" (USDA 1985, p.35). The Wilderness Act (P.L. 88-577) mandates that the Wilderness be managed as a community of life untrammeled by man, with its primeval character retained and its natural conditions preserved.

Affected Environment

Existing Condition

Current noxious weed infestations in the FC-RONR Wilderness comprise approximately .07 percent of the total Wilderness area (USDA 1999). Existing weed populations are expanding and new infestations are rapidly establishing in the FC-RONR Wilderness. Potential habitat for noxious weeds can be found within the Wilderness. The FC-RONR Noxious Weed Treatments Environmental Impact Statement identifies areas by cover type that are highly susceptible to noxious weed infestation. These cover types include, but are not limited to, upland grasslands, Douglas fir and ponderosa pine communities, and lower elevation riparian areas. None of the identified habitat types occur in or adjacent to the Golden Hand Mine project area. However, ground disturbing activities related to management projects or natural events such as high-intensity wildfires can increase the susceptibility of habitats to noxious weed invasion. Weed management efforts in the FC-RONR Wilderness include inventories, treatments, prevention, and education (USDA 1999). Noxious weed treatments include a combination of manual, chemical, and biological methods. High priority treatments focus on aggressive noxious weeds such as rush skeletonweed, yellow starthistle, and knapweed, which have infested some areas of the FC-RONR Wilderness.

A botanical survey was conducted in the area of the Golden Hand Mine site in July 2002. No noxious weeds were identified, however, the following naturalized or non-native species were present in the project area: *Trifolium repens* (white Dutch clover), *Taraxacum officinale* (dandelion), and *Rumex acetosella* (red sorrel).

Environmental Effects

Alternative A

Noxious weeds would likely continue to expand in the analysis area from other activities such as recreation. There is currently no monitoring for noxious weeds occurring in the project area.

Alternative B

Under Alternative B the proponent did not include provisions for washing vehicles and heavy equipment prior to entering NFS lands, or for monitoring to determine noxious weed establishment and spread. In addition, the proponent did not provide for the use of certified weed-free seeds for revegetating disturbed areas. The vehicular traffic and transport of heavy equipment into the Wilderness could increase the potential for noxious weed establishment and spread. The proposed ground disturbance associated with Alternative B may make the area more susceptible to noxious weed infestation, and could lead to new infestations of noxious weeds in and adjacent to the project area. The result of increased infestations could include reduced plant diversity and a degradation of the natural condition of the Wilderness.

Alternative C

Under this alternative, there could be an increase in the establishment and spread of noxious weeds. However, the amount of surface disturbance under Alternative C is less than Alternative B; therefore the area susceptible to noxious weed establishment would be less under this alternative than under Alternative B. In addition, there would be monitoring for noxious weeds, which is effective in preventing the establishment and spread of noxious weeds. Under this alternative there would be motorized access. To mitigate the effects of vehicles and heavy equipment traveling into the Golden Hand Mine site, the proponent would be required to hose down the tires and undercarriage with pressurized water to dislodge the seeds prior to entering the Payette National Forest. In addition, disturbed sites would be reseeded with native plants and monitored for any noxious weed infestations. Work crews trained in noxious weed recognition and removal would monitor the roadbeds and the area within 100' on either side of the road and mechanically remove any weeds or microtrash. These mitigations would reduce the potential for noxious weeds establishment and spread in and adjacent to the project area under this alternative.

Alternative D

Of the action alternatives, Alternative D would have the least likelihood of increasing noxious weed infestations. There would be no vehicle access to the Golden Hand Mine site under this alternative, no road construction, and no trenching, thereby reducing the amount of surface disturbance. Though packstock would be used, they would be required (96 hours before entering NFS lands and while in the Wilderness) to be fed certified weed-free feed. In addition, the packstock must be brushed thoroughly before entering the Wilderness, and hooves must be cleaned off. Additonal requirements for packstock are discussed in Appendix C. Alternative D includes the same mitigations as Alternative C.

Cumulative Effects

For Alternatives C and D, no contribution to cumulative effects associated with noxious weeds is expected. Under Alternative B, the effects of a lack of noxious weed prevention and monitoring would be cumulative with the increased use of the FC-RONR Wilderness for management and recreational purposes and the reasonably foreseeable development of Golden Hand No.1 and No. 2 lode mining claims (see Appendix A). The cumulative effect that could occur as a result of Alternative B would be an increase in the establishment and spread of noxious weeds.

Irreversible and Irretrievable Commitments

There would be no irreversible or irretrievable commitments associated with Alternatives A, C, and D. Under Alternative B there could be irretrievable commitments of resources if existing plant diversity is reduced by the establishment and spread of noxious weeds, and the natural condition of the Wilderness is compromised.

Forest Plan Consistency

The No Action alternative (Alternative A) and Alternatives C and D would meet Forest Plan and other directives. Alternative B would not be consistent with Forest Plan standards, guidelines, objectives, and goals. Specifically, Alternative B would not be consistent with FC-RONR Wilderness direction for seeding that requires native or naturalized seeds be used (USDA 1985, p.35). Alternatives C and D would be consistent with this direction.

Specialist Report

This DEIS hereby incorporates by reference the Project Record, which contains the detailed noxious weed data relied upon to reach the conclusions in this section of the DEIS.

Cultural Resources

Scope of the Analysis

Issue #10: The effects of the proposed activities on cultural resources and Tribal trust responsibilities.

Indicators

Compliance with:

- The National Historic Preservation Act (NHPA) as amended
- The Archaeological Resources Protection Act (ARPA)
- Executive Orders pertaining to the consultation and coordination with American Indian Tribal governments.

Background

The Idaho State Historic Preservation Office (hereafter referred to as SHPO) has determined the Golden Hand Mine site eligible to the National Register of Historic Places (NRHP). The SHPO advises and assists the Forest Service in identifying and preserving culturally significant properties. A cultural resource inventory was conducted in consultation with the SHPO to meet the Section 106 compliance process of the National Historic Preservation Act and its implementing regulations (36 CFR 800). Based on the inventory, the SHPO determined the Golden Hand Mine site was eligible to the NRHP as it met two criteria for nomination to the National Register: (1) The mine site is associated with events that have made a significant contribution to the broad pattern of Idaho's mining history; and (2) The mine site has yielded, or may be likely to yield, information important to the area's history (36 CFR 60).

Public comments regarding cultural resources and Tribal trust responsibilities addressed concerns such as potential threats to social, cultural, or historic areas within the project area, treaty fishing rights, and the effects of the project on other Tribal rights.

The Nez Perce Tribe has informed the PNF that the proposed activities are located within the Big Creek drainage in the FC-RONR Wilderness, and situated within the Tribe's territory as defined by the Treaty of 1855 and findings of the Indian Claims Commission Docket No.175. The Big Creek system was historically and still is very important to the life and culture of the Tribe. Tribal members have lived in and conducted subsistence and ceremonial activities in the Coin Creek/Beaver Creek area as well as the entire Big Creek drainage. The Tribe continues to exercise its treaty-reserved rights in these areas.

Management Direction

Cultural resource management on the Payette National Forest and in the FC-RONR Wilderness is guided by the Forest Plan, FC-RONR Wilderness Management Plan, National Historic Preservation Act (NHPA), the Archaeological Resources Protection Act (ARPA), the Forest Land Resource Management Act (FLRMA), and the Central Idaho Wilderness Act (CIWA). The NHPA and its implementing regulations (36 CFR 800), require that the potential effects on

cultural resources be considered for all undertakings that could adversely affect cultural resources. Avoidance of an effect is preferred over mitigation.

Forest Plan direction for cultural resources includes protecting cultural resources from damage or destruction by modifying project plans (USDA 1988, as amended, p. IV-3). Where protection of cultural resources is not possible, the Forest Plan directs that mitigation be undertaken to assure that the qualities of the mine site are retained or documented (USDA 1988, as amended, p. IV-7).

The Forest Plan requires that: "All reconstruction, remodeling, and maintenance of historic Government-owned buildings shall be done to the standards specified in the "Secretary of the Interior's Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings" (p. IV-116).

The FC-RONR Wilderness Plan (USDA 1985, as amended) directs that the cultural history of the area be recognized as a component of the wilderness resource and as such, provided the appropriate protection, interpretation, and additional research (FC-RONR Wilderness Management Plan, p. 98). The FC-RONR Wilderness Plan also contains direction mandated by the CIWA to protect culturally significant properties against destruction from natural deterioration (p. 108). Protection includes the restoration, stabilization, and maintenance of historic structures.

American Indian Rights

American Indian Tribes are afforded special rights under various federal statutes that include the NHPA, the Native American Graves Protection and Repatriation Act (NAGPRA), and the American Indian Religious Freedom Act (AIRFA). Federal guidelines direct federal agencies to consult with modern American Indian Tribal representatives who may have concerns about federal actions that may affect religious practices, other traditional cultural uses, as well as cultural resource sites and remains associated with American Indian ancestors. Any tribe whose aboriginal territory occurs within a project area is afforded the opportunity to voice concerns for issues governed by NHPA, NAGPRA, or AIRFA.

Federal responsibilities to consult with Indian tribes are included in Executive Orders 12875 and 13007. Executive Order 12875 calls for regular consultation with Tribal governments; and Executive Order 13007 requires consultation with Indian tribes and religious representatives on the access, use, and protection of Indian sacred sites.

The Golden Hand project area is located within ceded lands of the Nez Perce Tribe. Ceded lands are federal lands on which the federal government recognizes that a tribe has certain inherent rights conferred by treaty. In the Nez Perce Treaty of 1855, Article 3, the United States of America and the Nez Perce Tribe mutually agreed that the Nez Perce retain the right of:

> ...taking fish at all usual and accustomed places in common with citizens of the Territory [of Idaho]; and of creating temporary buildings for curing, together with the privilege of hunting, gathering roots and berries, and pasturing horses and cattle...

The government's trust responsibility requires the Forest Service (and other federal agencies) to assess proposed actions for their potential to affect treaty rights and interests including American Indian cultural resources, sacred sites, and other traditional cultural properties. Where potential impacts may exist, the federal agencies must seek consultation with the Nez Perce Tribe, and must address those impacts in planning documents and final decisions.

Analysis Area

The area where cultural resources are being directly or indirectly affected is within the FC-RONR Wilderness at the Golden Hand Mine site (Figure 2-1, Chapter 2) (see Photo 3-12). Cumulative effects to cultural resources are addressed for the entire portion of the FC-RONR Wilderness on the PNF (Management Area 26) (Figure 3-5).

Affected Environment

American Indians

American Indians have occupied the area of the present day FC-RONR Wilderness for thousands of years. Archaeological evidence suggests that ancient Indians (Paleo-Indians) were hunting and gathering in the Wilderness 9,000 to 10,000 years ago (Swanson and Sneed 1966; Gallagher 1975). When Euro-Americans arrived in the area in the early 19th century, the primary Tribal groups inhabiting the central Idaho mountains were the Nez Perce and the Northern Shoshone (Lowie 1909, Steward 1938).

American Indians of central Idaho relied on hunting, gathering, and fishing for their subsistence. Winter villages, associated with big game winter ranges, and access to good anadromous fishing areas, were located in the lower elevations of Big Creek and the Salmon Rivers (Liljeblad 1957). In the late spring or early summer, family units left their winter villages for higher elevations where vegetable root crops and big game could be found.

The influx of Euro-Americans into central Idaho in the early 19th century as a result of the fur trade, displaced the Indian populations. The gold rush in 1860 and later developments such as homesteading and agriculture further displaced Indian populations.

The Nez Perce Tribe has informed the PNF that the Big Creek system was historically and still is very important to the life and culture of the Tribe. Tribal members have lived in and conducted subsistence and ceremonial activities in the Coin Creek/Beaver Creek area as well as the entire Big Creek drainage. The Tribe continues to exercise its treaty-reserved rights in these areas.

Mining History

In the late 1800's, the gold rush brought miners into central Idaho from places such as Washington, Oregon, California, and Montana. The migration of merchants, laborers, and farmers followed. Mining communities began to develop in the Big Creek area in the 1880's. During this time period, gold placer deposits were found and worked along lower Smith Creek and for approximately one mile below the confluence with Big Creek. James M. Hand claimed the Golden Hand mineral lode discovery in 1889 (Cater et al. 1973).

Gold deposits discovered in 1901 at Thunder Mountain (approximately 21 straight-line miles from the Golden Hand Mine site) renewed the public's interest in gold prospecting in the Big Creek area (Waite 1994). Prospecting continued until 1909. Most mining claims in the Big Creek area were located prior to 1910 (Cater et al. 1973). There was renewed exploration and development at the Golden Hand Mine between 1932 and 1941. The majority of the facilities, equipment, and roads in the area of the claims are from this time period (Shenon and Ross 1936).

Photo 3-12. Vicinity of the Golden Hand Mine site with historic building

Existing Condition

The Golden Hand Mine site is located in a moderate probability zone for cultural resources. A probability zone indicates the probability of finding archeological, cultural, ethnographic, and historic locations based on factors such as paleo-environmental conditions, big game summer and winter ranges, mining districts, and homesteads (Forest Plan, p. IV-4). The analysis area was reviewed for American Indian cultural resources, sacred sites, and other traditional cultural properties. No known pre-historic sites were located in the vicinity of the Golden Hand Mine (Hartung 1977, Barton 1981, Rossillon 1981, Preston 1996, Dixon 2002); however, mining history remnants from the 1890's and 1930's are considered historic and eligible to the NRHP. These mining history remnants include six structures, three mine adits, a waste rock pile, and a variety of mining-related machinery.

The July 2002 site inventory conducted by a Forest Service Cultural Resource Specialist identified six structures at the Golden Hand Mine site that were constructed in the 1930s (Shenon and Ross 1936). The main bunkhouse, latrine, food storage building, and log cabin are standing, while the mill building and tipple tower with ore bins and a crusher, are collapsed. The main bunkhouse is the most prominent feature at the site, and is a large, 2 ½ storied, milled lumber framed building (Photo 3-13). This building is not located on claims No. 3 and No. 4 as shown

by the map of the claims area (Figure 2-1, Chapter 2). Three historic mine adits were also inventoried at the mine site along with an old road grader, boiler, and other mining-related machinery.

In addition to the historic remnants at the Golden Hand Mine site, there are six cultural resource properties adjacent to the access route to the mine (FR 371 and 373) that are potentially eligible to the NRHP. The Forest Service Heritage Program Manger will evaluate these sites in the summer of 2003 to determine eligibility; until that time, these sites will be treated as eligible and any impacts to these properties must be avoided. Although mining-related traffic would pass by these properties, none of the properties are close enough to the road to receive any impacts from the proposed plan or alternatives. These properties will not be discussed further in this analysis.

The PNF invited the Nez Perce Tribe to provide information on specific areas of Tribal interest in relation to the project, including areas of spiritual concern. The Tribe's comments focused on fish, wildlife, water quality, and cultural resources. The condition of these resources is described in the Fisheries, Wildlife, and Soil and Water Resource sections, respectively. The claims area provides very limited habitat for elk and deer. The claim area also contains berries (primarily *Vaccinium* sp.) and possibly other resources used by the Tribe. No pasture for horses and cattle occurs in the area. The Tribe was also concerned that the project include adequate monitoring, reclamation, and bonding. No information was provided on Tribal concerns related to social fabric or religious practices.

Photo 3-13. Bunkhouse north of claim No's. 3 and 4 at the Golden Hand Mine site

Environmental Effects

Any changes to cultural resources that are determined eligible to the National Register of Historic Places must be approved by the SHPO and a Section 106 review must occur. The Forest Service, in accordance with Section 106, consulted with SHPO on the potential effects of the proposed plan (Alternative B) on the Golden Hand Mine site. The Forest Service determined that there would be potential adverse effects to cultural resources as a result of the proposed activities at the Golden Hand Lode Mining Claims No. 3 and No. 4.

The Forest Service and SHPO agreed that partial mitigation of adverse effects could occur from the establishment of a Memorandum of Agreement (MOA) between the PNF and SHPO. This mitigation does not offset all potential adverse effects, but would lessen the effects. The MOA requires extensive site documentation such as archival quality photographs of the mining and mining related facilities, and narrative descriptions of the mine area and its history.

All alternatives would cause adverse effects to cultural resources by failing to restore the eligible properties.

Alternative A (No Action)

Under the No Action alternative, the existing cultural resource properties at the Golden Hand mine site would continue to be allowed to decay. Currently, the FS has no plans to restore, stabilize, or maintain the properties at the Golden Hand Mine to meet cultural resource protection standards. Although there would be no effects as a result of mine-related activities, allowing historical structures eligible to the NRHP to decay is considered an adverse effect. The extensive site documentation required by the MOA would lessen the adverse effects.

There would be no change to the current condition of the area and the ability of the Nez Perce Tribe to exercise treaty rights including "…taking fish at all usual and accustomed places in common with citizens of the Territory [of Idaho]; and of creating temporary buildings for curing, together with the privilege of hunting, gathering roots and berries, and pasturing horses and cattle…"

Alternative B

The proposed plan would have an adverse effect on cultural resources. Use and maintenance of the bunkhouse would adversely affect the historic buildings, particularly because the maintenance is not designed to comply with standards specified in the "Secretary of the Interior's Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings." Other mine-related activities at the Golden Hand mine site could displace or alter cultural sites. The presence of work crews and the mining activity taking place in close proximity to the historic properties may result in damage or removal of historic artifacts. The extensive site documentation required by the MOA would lessen the adverse effects.

Under this alternative, AIMM proposes to house the work crews in the bunkhouse, which would require a "general cleaning, replacement of the broken windows, and repair of the cook stove" (Ivy 2002). Eventually, AIMM would "enhance the foundation in order to secure the bunkhouse's longer-term viability" (Ivy 2002). These proposed upgrades to the bunkhouse are not specifically designed to historic preservation guidelines for an eligible historic property. The main bunkhouse is in poor condition and would require extensive renovation. An estimate of the

costs of renovating the bunkhouse to meet historic preservation needs has not been done, however, a building inspection was conducted and the cost estimate for improving the structure to meet Occupational Safety and Health Administration codes was $55,000 (report by PNF Building Inspector, 2002, in Project Record). It is expected that there would be additional costs (in excess of $55,000) to renovate the bunkhouse to meet historically significant building standards.

Alternative B would result in changes to the current condition of the immediate area in and around the mining claims as described in other resource sections. It is unknown how that might affect the ability of the Nez Perce Tribe to exercise treaty rights. Effects to fisheries are analyzed in the Fisheries Resource section. Alternative B is considered likely to degrade fish habitat, but the potential effect on the Tribe's "...taking fish at all usual and accustomed places" cannot be determined. Other impacts associated with use of the area are described in the Wilderness and Wildlife resource sections. The claims area provides very limited habitat for elk and deer, so hunting is unlikely to be affected. The claim area also contains berries (primarily *Vaccinium* sp.) and possibly other resources used by the Tribe. The proposed activities (roads, drill pads, and trenches) are estimated to affect approximately 5 acres of land area, with minimal impacts to any vegetative resources. No pasture for horses and cattle occurs in the area. Effects to Tribal social fabric or religious practice can only be assessed by the Nez Perce Tribe.

Alternatives C and D

Under these alternatives there would be adverse effects to cultural resource properties as a result of mining-related activities, but the effects would be less than in Alternative B because AIMM would not occupy the bunkhouse or use any of the other structures. The presence of work crews and the close proximity of the mining activity to the historic properties may result in damage or removal of historic artifacts. The extensive site documentation required by the MOA would lessen the adverse effects.

Alternatives C and D would result in changes to the current condition of the immediate area in and around the mining claims as described in other resource sections. Although it is unknown how that might affect the ability of the Nez Perce Tribe to exercise treaty rights, these alternatives would have fewer impacts to cultural resources than Alternative B. Effects to fisheries are analyzed in the Fisheries Resource section. Alternative C may degrade fish habitat in the area, but would have fewer impacts that Alternative B. Alternative D would have the least impacts to fish of all the action alternatives and is unlikely to have any effect on the Tribe's "...taking fish at all usual and accustomed places". Other impacts associated with use of the area are described in the Wilderness and Wildlife Resource sections. The claims area provides very limited habitat for elk and deer, so hunting is unlikely to be affected. The claim area also contains berries (primarily *Vaccinium* sp.) and possibly other resources used by the Tribe. Alternative C would disturb slightly fewer acres than Alternative B. Alternative D would have minimal ground disturbance because no roads would be constructed. It could be interpreted that the alternative with the least amount of ground, visual, and noise disturbance would likely have the least effect to Tribal treaty rights in relation to resource use. Ultimately, effects to Tribal social fabric or religious practice can only be assessed by the Nez Perce Tribe.

Cumulative Effects

Cumulative effects to cultural resources are addressed for the entire portion of the FC-RONR Wilderness on the Payette National Forest (Management Area 26). The FC-RONR Wilderness Plan (USDA 1985, as amended) directs that the cultural history of the area be recognized as a component of the wilderness resource and as such, provided the appropriate protection,

interpretation, and additional research (p. 98). For this reason, all alternatives would have some adverse effects to the cultural resources at the Golden Hand mine site. These effects are only partially mitigated by the establishment of a Memorandum of Agreement (MOA) between the PNF and SHPO for extensive site documentation. This effect would be cumulative to the loss of other cultural resource properties that are not being researched and protected in the Wilderness.

Cumulatively, when viewed across the entire area of the FC-RONR Wilderness available to the Nez Perce Tribe for "...taking fish at all usual and accustomed places in common with citizens of the Territory [of Idaho]; and of creating temporary buildings for curing, together with the privilege of hunting, gathering roots and berries, and pasturing horses and cattle...", any action alternative is expected to contribute minor incremental or cumulative effects. The PNF is unable to assess cumulative effects, if any, to Tribal social fabric or religious practice.

Irreversible and Irretrievable Commitments

Cultural resources are non-renewable resources, therefore any adverse effects are considered irreversible. If damaged or improperly removed from context, they are irreversibly lost. Under the No Action alternative, allowing the bunkhouse and other historic structures at the Golden Hand Mine site to deteriorate, is an irreversible commitment. Under the action alternatives, mining and mining-related activity at the Golden Hand Mine would damage the cultural resources at the Golden Hand Mine, and would result in an irreversible commitment.

Forest Plan Consistency

Forest Plan direction for cultural resources includes protecting cultural resources from damage or destruction by modifying project plans (USDA 1988, as amended, p. IV-3). Where protection of cultural resources is not possible, the Forest Plan directs that mitigation be undertaken to assure that the qualities of the mine site are retained or documented (p. IV-7). This mitigation includes the MOA with SHPO, which requires extensive site documentation such as archival quality photographs of the facilities and narrative descriptions of the mine history.

The Forest Plan requires that: "All reconstruction, remodeling, and maintenance of historic Government-owned buildings shall be done to the standards specified in the "Secretary of the Interior's Standards for Rehabilitation and Guidelines for Rehabilitating of Historic Buildings" (p. IV-116). Alternative B, the only alternative that proposes reconstruction or maintenance of the buildings, would not meet these standards.

According to the FC-RONR Wilderness Plan, the Central Idaho Wilderness Act mandates the protection of culturally significant properties against destruction from natural deterioration. While no alternative proposes to restore and maintain the structures to cultural resource standards, this would not preclude future opportunities to do so.

Federal responsibilities to consult with Indian Tribes are included in Executive Orders 12875 and 13007. These orders call for regular consultation with Tribal governments and Indian Tribes on the access, use, and protection of Indian sacred sites. Reviews of the Golden Hand Mine site, along with communications with the Nez Perce Tribe, did not discover any current or pre-historic American Indian sacred sites or other traditional cultural properties. The PNF will continue to consult with the Nez Perce Tribe about concerns relating to the project.

Specialist Report

This DEIS hereby incorporates by reference the Cultural Resources Specialist Report in the Project Record (40 CFR 1502.21). The Cultural Resources Specialist Report is located in Section 5(2) of the Project Record and contains the detailed data, methodologies, analyses, conclusions, maps, references, and technical documentation that the Heritage Program Manager relied upon to reach conclusions in this DEIS.

CHAPTER 4. PUBLIC INVOLVEMENT

Contents

CHAPTER 4
PUBLIC INVOLVEMENT

This chapter includes a summary of the scoping and public involvement efforts, and a list of all individuals, agencies, and organizations receiving a copy of this Draft Environmental Impact Statement (DEIS).

Public Involvement Summary

In 2002, the Payette National Forest (PNF) began the public involvement process for the operating plan for the Golden Hand No. 3 and No.4 lode mining claims submitted by American Independence Mine and Minerals, Inc. (AIMM). A Notice of Intent (NOI) to prepare an EIS was published in the April 19, 2002 issue of the *Federal Register*. The NOI invited comments on the proponent's operating plan and the environmental analysis for the Golden Hand No. 3 and No. 4 lode mining claims. The PNF also solicited comments from 476 interested parties that are on a Forest-wide mailing list, and issued a press release in *The Star News*, a McCall newspaper. This project has been listed on the Payette National Forest Quarterly Schedule of Proposed Actions since before the release of the NOI. In addition, the Forest Service held a public meeting on May 21, 2002 at the Krassel Ranger District in McCall, Idaho.

In response to these scoping efforts, the PNF received 212 oral and written comments. The comments received from the initial scoping helped to identify issues and develop alternatives presented in this document. Some of these comments are summarized at the end of this chapter and are grouped under the resource to which the comments pertain. Comments received are made part of the Project Record and are available for public review pursuant to the Freedom of Information Act. The Forest Service originally scoped this operating plan in 1996 but no decision was made at that time.

A complete detail of meetings, telephone calls, written correspondence, and other public involvement communications are documented in the Project Record.

Coordination with Tribal Governments

During the scoping process, a scoping letter was sent to the Honorable Samuel N. Perry of the Nez Perce Tribal Executive Committee. In addition, an invitation was extended to Kevin Brackney, a Hydrogeologist/Water Planner with the Nez Perce Tribe, to go on a field trip of the Golden Hand Mine site; however, the trip was cancelled due to poor weather.

List of those Receiving the DEIS

The Krassel Ranger District notified interested parties by letter and by e-mail on February 7, 2003 that the DEIS would be available the end of February. The below individuals, agencies, and organizations received a hard copy or summary of the DEIS, however, there are also individuals who requested to view the DEIS on the Internet—these interested parties are not listed.

Individuals
Dr. John Hendee
Becky Johnstone
Stan Bonney
Dennis Baird
Jack Williams
Jim Holmes
John Lewinski
John Cantlon
Paul Moyer
Tom Blanchard

Businesses and Organizations
Alliance for Wild Rockies
The Ecology Center
Idaho Conservation League
Idaho Rivers United
Idaho Sporting Congress
The Wilderness Society
Kettle Range Conservation Group
Association of Logging Contractors
Advocates for the West
Western Mining Action Project
Mineral Policy Center

City, State, and County Officials or Agencies
Idaho Department of Lands
Idaho Department of Fish & Game
Idaho Department of Parks and Recreation
Idaho Department of Water Resources
Southwest Idaho Division of Environmental Quality
Washington County Commissioners
Valley County Commissioners

Federal Agencies
Advisory Council on Historic Preservation
Agriculture, U.S. Department of:
- Forest Service
  - Director, Environmental Coordination
  - Intermountain Regional Office
  - Boise National Forest
- General Service Administration, Office of Planning and Analysis
- National Agricultural Library
- Natural Resource Conservation Service

Commerce, U.S. Department of:
- National Oceanic and Atmospheric Administration
  - National Marine Fisheries Service

Environmental Protection Agency
Federal Energy Regulatory Commission
Interior, U.S. Department of:
- Bureau of Land Management

Office of Environmental Policy and Compliance
U.S. Fish and Wildlife
Rural Electrical Administration

Tribal Governments
Nez Perce Tribal Executive Committee
Nez Perce Tribe Water Resources Division
Nez Perce Tribe Program Manager- Dave Johnson

Major Comments from the Public, Agencies, Organizations, and Tribal Governments

Listed below are some of the comments received in response to scoping on the proposed operating plan submitted by AIMM. The comments are grouped by the resource to which they pertain. All of the comments are made part of the Project Record and are available for review at the Krassel Ranger District, McCall, Idaho.

Minerals and Geology

- This project is proposing to develop formerly established ore-containing rocks. All activity must be limited to sites where deposits have already been properly located, documented, and the value determined. No further mineral exploration outside of these specific areas is to be allowed.
- Based on verbal and published accounts of mining activities in the area of the Golden Hand claims, it is not likely that significant mineralization, which could be processed profitably, will be found. I know that experienced persons with extensive knowledge of the area surveyed these claims subsequent to the most recent mining activities and recovered some samples for analysis, all of which proved to be unsupportive of further development.
- The Plan of Operations for the Golden Hand is both reasonable and incidental to mining.
- The reclamation of the area must take place concurrently with the mining operation and return the site to a more natural condition than presently exists. Topsoil and large woody debris should be salvaged and replaced following operations. This bond should cover refilling all trenches and mine shafts, recontouring and revegetating the site, removing noxious weeds, obliterating the road, removing all structures, naturalizing the area, and gating the trailhead. Complete reclamation, including road obliteration, must occur after two years of operation. The reclamation bond must be independent of the bond covering AIMM's Antimony Rainbow mine or any other AIMM operation. The bond must be substantive enough to cover the worst possible impacts to the area's fragile ecosystem as well as the area surrounding the transportation route and processing site.
- The Forest Service should reserve the right to conduct independent analyses of metal content from samples of materials produced during the operation of the Plan. Let’s not find ourselves in the position of having the public responsible for the entire cost of reclamation in the event the applicant declares his intention to proceed with a full scale mining operation, only to find that the costs of removing and processing the ore exceeds the value of the finished product.
- The operator must plan and fund for a full restoration of the mine and processing areas. In addition, the Forest must demand a bond from the operator that will facilitate a full reclamation of the mine and processing areas.

- If there is to be mining in the Frank Church wilderness, let access and extraction be with the technology that was available when the 1872 mining law was enacted. Specifically, I oppose the use of any internal combustion engines in the process of gaining access to the site or extracting the mineral

Roads and Access Management

- The roads associated with the mining claims were established pursuant to RS 2477 or 43 USC 932.
- Old roadbeds were often situated in places for convenience not environmental concern. In order to minimize erosion, the roadbed needs to be reassessed and redesigned with the most environmentally sound techniques possible.
- A provision must be made in the Plan to upgrade the road before operations commence and to properly maintain the road until (after) the operations are completed.

Wilderness Resource

- The use of mechanized equipment in a National Forest Wilderness Area is completely incompatible with the wilderness character.
- "In the long run, preventive conservation is much less expensive than restorative conservation. More important, some environments, once blighted by man, can never lie repaired, no matter what we do. "All our billions, all our technology, can never restore a single acre of wilderness if we fail to preserve it" (quote by Secretary of Agriculture Orville Freeman, 1967).
- The Forest Service must "ensure that provisions approved in operating plans are the minimum necessary to accomplish the rights of the claimant while creating the least impact on the wilderness resource" (FSM § 2323.7). Again, it is crucial that the environmental analysis for this project take all steps necessary to protect the wilderness character of the involved landscape.
- Those areas are set aside and protected for future generations to enjoy. Please do not destroy them.
- If you feel you have the right to reverse any small portion of a wilderness trust, you are setting a precedent for any kind of future changes that will cumulatively reduce the wild worth of that designated investment of our forefathers.
- Industrial activity is antithetical to the concept of wilderness. As a hunter and outdoorsman, I value the peace, serenity and solitude of wilderness areas on our National Forests. I do not want those qualities destroyed by mining or other industrial use of our wilderness.
- This is the last contiguous wilderness piece in the continental US... This is an extremely sensitive area and would be greatly harmed by the allowance of roads and mining equipment.
- Roads and drilling and all the related activity will destroy one of the most beautiful areas around.
- The access would require vehicle passage for 2.7 miles inside the FC-RONR Wilderness on Forest Service Trail #013. Improvements needed for safe vehicle passage and the amount of traffic generated by hauling the extracted ore to the mill site are unacceptable in a wilderness environment.
- If the Forest Service approves the proposed plan of operations, many wilderness users will question how this operation could possibly be permitted in a wilderness area. Interpretive displays should be erected at the trailhead and mining site explaining the

validity of the mining claims in wilderness areas and describing all the mitigation measures that are in place, a timeline for reclamation, as well as an illustration of what the site will look like once reclaimed. These displays should include a box for public feedback about the operation. Tours of the site to interested parties could also be offered. In addition, this information should be readily available on the Payette National Forest web site. The trail and mining site should remain open to the public so backcountry visitors can see for themselves how well all the mitigation measures are working...

Soil and Water Resources

- The EIS should fully disclose existing water quality in and downstream of the project areas…should describe how water quality would change …
- Concern that the areas in question are within Riparian Habitat Conservation Areas (RHCAs), which protect streams from non-channelized sediment inputs…
- Mining roads have been big contributors of sediment in drainages, threatening endangered species such as the bull trout.
- Any fuel or oil spill from a vehicle accident could potentially be very damaging to the habitat along or within the streams.
- Geochemical issues should include preexisting water quality from previous mining activities, potential for acid mine drainage or other contaminants, transportation of hazardous or toxic materials near streams…waste water discharge from site, storm water runoff.
- The EIS should …identify those wetlands that the project would affect and describe those effects…
- The discharge of dredged or fill material…requires a CWA Section 404 permit form the army Corps of Engineers (Corps)…an applicant for a permit normally must demonstrate…the sequencing requirement has been met before the Corps will issue a permit. The EPA has permit review and enforcement responsibility…
- The effects of mining activities on surface water and groundwater quantity…
- EPA recommends that the EIS characterize whether water flowing from the adit is a point source discharge to a water of the United States…describe the quality and quantity of the existing discharge, seasonal fluctuations…also characterize the quantity and quality of the receiving water. Predictions…should recognize proposed water diversions from Coin Creek by the mine proponent. The EIS should indicate how the applicant proposes to use diverted water.
- *Water Quality*: The EIS should fully disclose existing water quality in and downstream of the project areas…should describe how water quality would change with adoption of action alternatives…should describe whether action alternative would adversely affect the water quality of pristine streams flowing from the wilderness boundary and thus potentially violate Idaho's anti-degradation policy. Hope that applicable Best Management Practices will be effectively implemented and maintained to protect water quality. In the past, mining roads have been big contributors of sediment in drainages.
- *RHCAs*: Concern that the areas in question are within Riparian Habitat Conservation Areas (RHCAs), which protect streams from non-channelized sediment inputs, act as source of wood, and provide other necessary ecosystem functions.
- *Cumulative effects*: Cumulative effects on the riparian and stream environment…should include, at a minimum, summing the impacts from all activities (i.e. mining, grazing, and roads) in the watershed.

- *Sediment*: Past mining operations cause stream degradation. Mining roads have been big contributors of sediment in drainages, threatening endangered species such as the bull trout.
- *Fuel/Oil Spills:* Forest Roads (FR) leading into the area are very narrow, uneven, and close to Smith Creek or tributaries in many areas; any fuel or oil spill from a vehicle accident could potentially be very damaging to the habitat along or within the streams.
- *Mining Contaminants*: Geochemical issues should include preexisting water quality from previous mining activities, potential for acid mine drainage or other contaminants, transportation of hazardous or toxic materials near streams, on-site water needs, waste water discharge from site, storm water runoff. EPA recommends that the EIS characterize whether water flowing from the adit is a point source discharge to a water of the United States...describe the quality and quantity of the existing discharge.
- *Impacts to Wetlands*: The EIS should map any wetland boundaries and disclose whether those boundaries were determined through a wetland delineation...describe wetland functions and rank or quantify those functions...identify those wetlands that the project would affect and describe those effects...include a description of the area of wetland affected, the functions impaired, and the extent of the impairment.
- *Discharge of Dredge/fill Material*: The discharge of dredged or fill material...requires a CWA Section 404 permit form the army Corps of Engineers (Corps)...an applicant for a permit normally must demonstrate...the sequencing requirement has been met before the Corps will issue a permit. The EPA has permit review and enforcement responsibility...

Fisheries Resource

- The area in question is within a Riparian Habitat Conservation Zone. Mining operations will harm threatened or endangered bull trout, chinook salmon, steelhead, and westslope cutthroat trout that occupy the waters downstream of the site.
- Upgrading Forest Roads 371 and 373 for the type of large vehicle use proposed must take into account ...threats to water quality and fisheries...

Wildlife Resource

- Threatened and endangered species in this area include ...lynx, and gray wolves. The U.S. Forest Service must submit a biological assessment on all possible threats to listed species and the USFWS and NMFS must approve the report with a "no jeopardy" finding. No incidental takings permit should be allowed.
- The EIS must assess how all alternatives will impact wildlife in the analysis area. This assessment must include the effects of noise and waste generated by the mine as well as disturbance from increased human use and access.
- All food must be stored in bear-proof containers to minimize interactions with wildlife. All garbage must be removed from the Wilderness Area and disposed of appropriately.

Noxious Weeds

- The vehicular traffic into the wilderness area will serve as a vector for noxious weeds, an ecological problem of epidemic proportions...
- The EIS must assess how the mine operation and all connected activities will contribute to the spread of noxious weeds in the FC-RONR Wilderness.
- Disturbed soil and waste rock piles need to be reseeded with native plants, and weeded to prevent expansion of noxious weeds. Work crews trained in noxious weed recognition

and removal should patrol the roadbed and the area within 100' on either side of the road and mechanically remove any weeds or microtrash.

- If pack animals are to be used in this operation, 96 hours before entering and while in the Wilderness Area they should be given feed that has been certified weed free. Before entering the Wilderness Area, pack animals must be brushed thoroughly and their hooves must be cleaned, and all feed must be certified weed-free. Saddles and tack must also be cleaned off. These stipulations need to be included in the Plan of Operations.
- If vehicle access is allowed, the tires and undercarriage must be hosed down with pressurized water to dislodge seeds. The wastewater needs to be collected on a tarp and strained to collect seeds for disposal in plastic bags. This stipulation needs to be included in the Plan of Operations.

Cultural Resources

- Address potential threats to social, cultural or historic areas within the access area.
- The Columbia River Inter-Tribal Fish Commission is very concerned that mining of the Golden Hand claims may cause significant adverse impacts to anadromous fish habitat and thus treaty fishing rights.
- The analysis must consider treaty-secured tribal fishing rights and thoroughly discuss the effects of the project on tribal rights. This discussion must be more than a just an acknowledgment of tribal rights, and more than just a quick reference on how the right relates the anticipated effects on fish. Discussion must be on the effect of the action on the *treaty right,* the exercise of the treaty right, and how the level of exercise may affect tribal social fabric or religious practice.... The analysis must examine each alternative and design and adopt an alternative in the light of the federal government's obligation to maximize recovery of fish habitat to support the exercise of treaty fishing rights. The analysis must similarly address other cultural resources.
- Proposed activities such as this in a wilderness area are of great concern to the Nez Perce Tribe. The potential effect on Tribal trust resources, managed by the U.S. Forest Service (USFS) as a trust responsibility to the Tribe, is substantial.

CHAPTER 5. LIST OF PREPARERS

CHAPTER 5
LIST OF PREPARERS

The following are members of the Interdisciplinary (ID) Team and other contributors responsible for preparing this Draft Environmental Impact Statement (DEIS), including background documents. All personnel are employees of the Payette National Forest, unless otherwise noted. Forest Service experience is as of January 2003.

Interdisciplinary Team Members

Ana Egnew- Land Management Planner and ID Team Leader; BA Biology, MS Wildlife Biology; 15 years Forest Service (FS) employment. ID Team leader, reviewed all of the resource analyses, prepared Chapters 1 and 2.

Debbie Artimez- Fisheries Biologist, NOAA Fisheries (on a FS detail); BS Environmental Science; 6 months FS employment. Prepared the Fisheries Resource analysis.

Alma Hanson- Forest Botanist; BS Education, MS Botany; PhD. Education; 13 years FS employment. Prepared the Threatened, Endangered, and Sensitive Plants Specialist Report.

Mike Dixon- Civil Engineer; BS Civil Engineering, BS Forestry; 23 years FS employment. Prepared the Roads and Access Management analysis.

Sandy Kollenberg- Zone GIS Coordinator; BA Environmental Studies, BS Biology; MS Forestry; 5 ½ years FS experience. Prepared maps and conducted queries for the analysis.

Larry Kingsbury- Heritage Program Manager; BA Cultural Resource Management; 14.5 years FS employment. Prepared the Cultural Resources analysis.

Joe Gurrieri- Reclamation Specialist/Hydrogeologist; BA Geography, MS Geology; 2 years FS employment. Prepared the Soil and Water Resources analysis.

Jenni Blake- Wilderness Program Assistant; BS Environmental Studies/Geology; 16 years FS employment. Prepared the Wilderness Resource analysis.

Jim Egnew- Minerals and Geology Program Manager; BA Geology; 12 years FS employment. Prepared the Minerals and Geology analysis, reviewed Chapters 1 and 2.

Chris Hescock- Krassel Ranger District Wildlife Biologist; BS Wildlife Biology; 25 years FS employment. Prepared the Wildlife Resource analysis.

Shannon Campbell- Writer/Editor; BA International Studies; MS Geography; 3 years FS employment. Served as writer/editor for the DEIS.

Other Contributors

Dan Schlender- Landscape Architect, Boise National Forest; BS Landscape Architecture; 23 years FS employment. Reviewed the Wilderness Resource analysis.

Peggy Weaver- Writer/Editor and Hydrologic Technician; BA Fine Arts with a minor in Biology; 14 years FS employment. Reviewed the Soil and Water Resources and the Fisheries Resource analyses.

Karen Ketchu- Office Automation Clerk and Writer/Editor; BS Biological Sciences; 5 years FS employment. Reviewed the Fisheries Resource analysis.

Dave Burns- Forest Fisheries Biologist; BA General Biology, MS Zoology, PhD. Wildlife Science; 25 years FS employment. Reviewed the Fisheries Biological Assessments and the Fisheries Resource analysis.

Jane Cropp- External Relations Branch Chief; BS Natural Resource Management; 17 years FS employment. Reviewed the Wilderness Resource analysis.

John Rygh- Geologist; BS Geology; 10 years FS employment. Prepared the Best Management Practices Appendix and mitigations for mining.

Clem Pope- Recreation and Wilderness Management Resource Specialist; BS/MS Forest Recreation Management; 25 years FS employment. Reviewed the Wilderness Resource analysis.

Mary Faurot- Fisheries Biologist; BS Biological Science; MS Fish and Wildlife Management; 13 years FS employment. Prepared the initial Fisheries Biological Assessment.

CHAPTER 6. REFERENCES

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CHAPTER 7. ACRONYMS AND GLOSSARY

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ACRONYMS AND GLOSSARY

ACHP	Advisory Council on Historic Preservation
AIMM	American Independence Mines and Minerals, Inc.
ARPA	Archaeological Resources Protection Act (ARPA)
BA	Biological Assessment
BE	Biological Evaluation
BLM	Bureau of Land Management
BMP	Best Management Practice
BO	Biological Opinion
CFR	Code of Federal Regulations
COE	U.S. Army Corps of Engineers
CWA	Clean Water Act
CWD	Coarse Woody Debris
DBH	Diameter at Breast Height
DD	Detrimental Disturbance (soils)
DEIS	Draft Environment Impact Statement
EA	Environmental Assessment
EIS	Environmental Impact Statement
EO	Executive Order
EPA	Environmental Protection Agency
ERU	Ecological Reporting Unit
ESA	Endangered Species Act
EAWS	Ecosystem Analysis at the Watershed Scale
FC-RONR	Frank Church-River of No Return
FEIS	Final Environmental Impact Statement
FSH	Forest Service Handbook
FSM	Forest Service Manual
GPD	Gallons per day
GI	Geomorphic Integrity
GIS	Geographical Information System
GPS	Global Positioning System
HUC	Hydrologic Unit Code
ICBEMP	Interior Columbia Basin Ecosystem Management Project
ID Team	Interdisciplinary Team
IDWR	Idaho Department of Water Resources
LWD	Large Woody Debris
MFSR	Middle Fork Salmon River
MIS	Management Indicator Species
MOA	Memorandum of Agreement
NEPA	National Environmental Policy Act
NF	National Forest
NFMA	National Forest Management Act
NFS	National Forest System
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service

NOI	Notice of Intent
NOAA	National Oceanic and Atmospheric Administration
PNF	Payette National Forest
RHCA	Riparian Habitat Conservation Area (from Pacfish)
RMO	Riparian Management Objective
ROD	Record of Decision
RVD	Recreation Visitor Day
SFSR	South Fork Salmon River
SHPO	State Historic Preservation Office
TEPS	Threatened, endangered, proposed/petitioned, and sensitive species
TES	Threatened, endangered, and sensitive species
TMDL	Total Maximum Daily Load
TSRC	Total Soil Resource Commitment
USDA	United States Department of Agriculture
USDI	United States Department of Interior
USFWS	United States Fish and Wildlife Service
WQL	Water Quality Limited

GLOSSARY

Abiotic- Non-living (refers to air, rocks, soil particles, etcetera).

Adfluvial fish- Fish that migrate between lake and river systems; such as land-locked kokanee salmon or some bull trout.

Air quality- The composition of air with respect to quantities of pollution therein; used most frequently in connection with "standards" of maximum acceptable pollutant concentrations.

Allotment (grazing)- Area designated for the use of a certain number and kind of livestock for a prescribed period of time.

Alteration minerals- Minerals which are created from other minerals mainly by weathering or the action of hydrothermal fluids.

Alternative- One of a number of possible options for responding to the purpose and need for action.

Anadromous fish- Fish that hatch and rear in fresh water, migrate to the ocean, mature there, and return to fresh water to reproduce; for example, salmon and steelhead.

Analysis Area- One or more areas grouped for purposes of analysis based on common impacts, effects, and social or economic factors.

Aquatic ecosystem- 40 CFR 230.3 - Waters of the United States that serve as habitat for interrelated and interacting communities and populations of plants and animals. FSM 2526.05 - The stream channel, lake or estuary bed, water, biotic communities and the habitat features that occur therein.

Argillite- A very fine-grained sedimentary rock that is not as hard as shale.

Arterial road- A road serving a large land area and usually connecting with public highways or other Forest Service arterial roads to form an integrated network of primary travel routes. The location and standards are often determined by a demand for maximum mobility and travel efficiency rather than specific resource management service. Arterial roads are usually developed and operated for long-term land and resource management purposes and constant service.

ASQ (Allowable Sale Quantity)- On a National Forest, the quantity of timber that may be sold from a designated area covered by the forest plan for a specified time period.

Batholith- A body of intrusive rock at least forty square miles in area.

Bedding planes- In sedimentary rocks, the division planes which separate the individual layers.

Bedload- Sediment that moves along the stream channel bottom by rolling, sliding, or bouncing.

Beneficial use- An actual or potential use that may be made of the waters of the state that is protected against quality degradation. Examples of beneficial uses include domestic, agricultural, and industrial water supplies, recreation, aquatic life, aesthetics, wildlife habitat, and salmon spawning.

Best Management Practices- Practices determined by the Idaho Department of Environmental Quality to be the most effective and practicable means of preventing or reducing the amount of pollution generated by non-point sources.

Big game- Large wild animals that are hunted for sport and food. This hunting is controlled by state wildlife agencies. Big game animals found on the Payette NF include deer, elk, and moose.

Biological diversity (or biodiversity)-The variety and abundance of life and it's processes. Biological diversity includes all living organisms, the genetic differences among them, and the communities and ecosystems in which they occur. Biological diversity also refers to the compositions, structures, and functions of species and habitats and their interactions.

Biota- Living material. The flora and fauna of an area.

Biotite-muscovite granite- An intrusive igneous rock containing both biotite and muscovite mica.

Biotite phyllite- A very fine-grained metamorphic rock containing biotite mica.

BMPs (Best Management Practices)- Practices determined by the State of Idaho Division of Environmental Quality to be the most effective and practical means of preventing or reducing the amount of pollution generated by non-point sources.

Boreal- associated with northern biogeographical region, or the northern coniferous forest growing in that region.

Buffer- A land area that is designated to block or absorb unwanted impacts to the area beyond the buffer. Buffers along streams can greatly reduce any changes or impacts to stream water quality, temperature, or stream stability.

Calcite- A calcium carbonate mineral.

Candidate species- Plant and animal species being considered for listing as endangered or threatened, in the opinion of the US Fish & Wildlife Service (USFWS) or the National Oceanic and Atmospheric Administration (NOAA). Category 1 candidate species are groups for which the USFWS or NMFS has sufficient information to support listing proposals; category 2 candidate species are those for which available information indicates a possible problem, but that need further study to determine the need for listing.

Chalcopyrite- An ore mineral of copper.

Classified road- Roads wholly or partially within or adjacent to national Forest System lands that are determined to be needed for long-term motor vehicle access. Classified roads can include state roads, county roads, privately owned roads, National Forest System roads, and other roads authorized by the Forest Service.

Collector road- A road serving smaller land areas than an arterial road and usually connected to a Forest arterial road or public highway. These roads collect traffic from Forest local roads and/or terminal facilities. The location and standard are influenced by both long-term multi-resource service needs, as well as travel efficiency. These roads may be operated for either constant or intermittent service, depending on land use and resource mangement objectives for the area served by the facility.

Composition (species)- The species that make up a plant or animal community, and their relative abundance.

Contact zone- The area of rock surrounding an intrusive body that has undergone thermal metamorphism.

Connectivity- The arrangement of habitat that allcws organisms and ecological processes to move across the landscape. Patches of similar habitats are either close together or connected by corridors of appropriate vegetation (or live stream channels). Opposite of fragmentation.

Corridor (landscape)- Landscape element that connect similar patches of habitat through an area with different characteristics. For example, streamside vegetation may create a corridor of willows and hardwoods between meadows or through a conifer forest.

Cover type- The current or existing vegetation of an area, described by the dominant vegetation.

Critical habitat- Specific areas designated by the U.S. Fish and Wildlife Service or National Marine Fisheries Service occupied by a threatened or endangered species, on which are found physical or biological features essential to conservation of the species. These areas may require special management consideration or protection, and can also include specific areas outside the occupied area that are deemed essential for conservation.

Critical life stages- Animal life stages associated with the time of the year when reproduction, rearing young, and over-wintering occur.

Crustal extension- The pulling apart of near-surface rocks.

Cultural resources- Cultural resources include sites, structures, or objects used by prehistoric and historic residents or travelers. They are non-renewable resources that tell of life-styles of prehistoric and historic people. Cultural resources are diverse and include properties such as archaeological ruins, pictographs, early tools, burial sites, log cabins, mining structures, guard stations, and fire lookouts.

Cumulative effects- Impacts on the environment that result from the incremental impact of an action when added to other past, present, and reasonably foreseeable future actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time.

Cut slope- that portion of the slope that is excavated for road construction, trails, or landings.

CWD (coarse woody debris)- Pieces of woody material having a diameter of at least three inches and a length greater than six feet (also referred to as large woody debris, or LWD).

Debris flow- The sudden movement and transport of a liquefied matrix of firm soil material and woody debris down a stream or river channel.

Denning habitat or sites- Habitat and locations used by mammals during reproduction and rearing of their young, when the young are highly dependent on adults for survival.

Detrimental disturbance- Detrimental disturbance to soil is the alteration of natural soil characteristics that results in immediate or prolonged loss of soil productivity and soil-hydrologic conditions. This can occur from soil that has been displaced, compacted, or severely burned. Determination of DD excludes existing or planned classified transportation facilities, dedicated trails, and landings, mining dumps or excavations, parking areas, developed campgrounds, and other dedicated facilities.

Developed recreation- Recreation that requires facilities that in turn result in concentrated use of an area; for example, a campground or ski resort.

Development- Stage of mining activity that occurs once exploration drilling and other activities have identified a valuable mineral deposit (i.e., ore grade and a significant reserve have been established); but the dimensions of the ore deposit have not been fully delineated, and all the parameters necessary for mine design and production are not yet known or understood. The purpose of development is to delineate the orebody; establish grade and reserves with a high degree of probability so that the economics of the deposit can be fully evaluated; and provide the claimant/operator with the information necessary to make a decision as to when and whether to invest the capital necessary to progress to the next stage of mining activity: production.

Dike- A tabular body of igneous rock that cuts across the structure of adjacent rocks.

Dike swarm- A set of numerous parallel dikes.

Direct effects- Effects caused directly by an action and occurring at the same time and place.

Dispersed recreation- Recreation that does not occur in a developed recreation setting, such as hunting, scenic driving, or backpacking.

Disseminated- Fragments of mineral dispersed in a rock

Disturbance- Any event, such as wildfire or a timber sale, that alters the structure, composition, or function of an ecosystem.

Draft Environmental Impact Statement (DEIS)- see Environmental Impact Statement.

Ecosystem- A naturally occurring, self-maintained system of living and non-living interacting parts that are organized into biophysical and human dimension components.

Ecosystem health- A condition where the components and functions of an ecosystem are sustained over time and where the system's capacity for self-repair is maintained, such that goals for ecosystem uses, values, and services are met.

Elk Habitat Effectiveness (EHE)- A weighted numeric rating system having values between 0 and 100 that describe elk habitat quality based on open road density, road impact ratings, forage/cover ration, and the juxtaposition of forage and cover on the landscape. The higher the number, the better the habitat.

Elk Management Unit (EMU)- A geographical analysis unit that represents an elk's movements and home range. Elk management units are made up of smaller units called Issue Reporting Areas (IRA's).

Emplacement- The movement of molten rock to a particular position.

Endangered species- Designated by the U.S. Fish and Wildlife Service or National Marine Fisheries Service, an animal or plant species that has been given federal protection status because it is in danger of extinction throughout all or a significant portion of its natural range.

Endangered Species Act (ESA)- An act passed by Congress in 1973 intended to protect species and subspecies of plants and animals that are of "aesthetic, ecological, educational, historical, recreational, and scientific value". It may also protect the listed species' critical habitat, the geographic area occupied by or essential to the species. The U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS) share authority to list endangered species, determine critical habitat, and develop species' recovery plans.

Environmental Impact Statement (EIS)- A document required of federal agencies by the National Environmental Policy Act for major projects or legislative proposals significantly affecting the environment. A tool for decision making, it describes the positive and negative effects of the undertaking and analyzes alternative actions.

Ephemeral stream- A stream or portion of a stream that flows only in direct response to precipitation or run-off events, and that receives little or no continuous water from springs, snow, or other sources. Unlike intermittent streams, an ephemeral usually does not have a defined stream channel or banks, and its channel is at all times above the water table.

Epidote- A green silicate mineral.

Erosion- The transportation of earth and rock materials by water, ice, wind, and gravity.

Essential habitat- Used to describe habitat of listed species under ESA, but not designated as "critical habitat". Essential habitat has all the important elements of habitat necessary to sustain a species.

Executive Order (EO)- Executive Orders are official documents, numbered consecutively, through which the President of the United States manages the operations of the federal government.

Exotic species- Animals or plants that have been introduced from a distant place and are non-native to the area of introduction.

Exploration- The second stage in the logical progression of mining activities. It usually occurs once a geologically favorable target area, i.e., with moderate to high mineral potential, has been identified through prospecting, but subsurface information is needed to determine the presence

and extent of any mineral resources and whether any of this constitutes economic reserves. Its purpose is to narrow the search for a mineral resource, better define a target, and ultimately to discover a valuable mineral deposit that can be mined, removed, and marketed at a profit. This stage is typified by the use of motorized portable ground disturbing equipment, such as truck or track mounted drill rigs and backhoes.

Facies- Part of a rock body as differentiated from other parts by composition or appearance.

Fault- A fracture that has displacement of the two sides relative to each other parallel to the fracture.

Final Environmental Impact Statement (FEIS)- See Environmental Impact Statement.

Fine sediment- Or surface fines. Mineral and organic particles smaller than 6.3 millimeters in diameter.

Fluvial fish- Fish that migrate, but only within a river system. Bull trout that migrate into larger river systems.

Fluvial granitics- Topography that has been formed from granitic parent material and altered through the erosive force of running water.

Forage- All browse and non-woody plants that are available to livestock or wildlife for grazing or harvested for feeding.

Forbs- Any herbaceous plant other than true grasses, sedges, or rushes.

Forest road- As defined in Title 23, Section 101 of the United States Code, any road wholly or partly within, or adjacent to, that serves the National Forest System and that is necessary for the protection, administration, and utilization of the National Forest System and the use and development of its resources.

Galena- The primary ore mineral of lead.

Gangue mineral- A nonmetallic, or nonvaluable metallic mineral associated with ore minerals.

Geogrid- An expandable plastic grid material used for soil and substrate stabilization.

GIS (Geographic Information System)- A computer system that stores and uses spatial (mappable) data.

Glacial trough- A U-shaped valley carved by a glacier.

Granite- A light-colored, coarse-grained igneous rock

Ground cover- Ground cover consists of vegetation, litter, and rock fragments in contact with the soil. It also consists of perennial canopy cover that is within three feet of the ground, including leaves and branches that persist for more than a year. Minimum amounts of ground cover needed to protect soil from erosion are a function of soil properties, slope gradient and length, and erosivity (precipitation factor), and need to be determined locally.

Habitat- A place that provides seasonal or year-round food, water, shelter, and other environmental conditions for an organism, community, or population of plants or animals.

Historic property- Any pre-historic or historic district, site, building, structure, or object included on, or eligible for inclusion on the National Register, including artifacts, records, and material remains related to such a property or resource.

Historical Range of Variability (HRV)- The natural fluctuation of healthy ecosystem components over time. In this document, HRV refers to the range of conditions and processes that likely occurred prior to settlement of the area by people of European descent (around the mid 1800s), and that would have varied within certain limits over time.

Hydrologic Unit Code (HUC)- A hierarchal coding system developed by the U.S. Geological Service to map geographic boundaries of watersheds of various sizes.

Hydrologic cycle- Also called a water cycle, it is the process of water evaporating, condensing, falling to the ground as precipitation, and returning to the ocean as run-off.

Hydrothermal system- A subsurface network of convecting hot water.

Idaho batholith- A great mass of intruded igneous rock that is primarily granite and covers much of central Idaho.

Igneous- a type of rock formed by the solidification of molten or partially molten material.

Indicated reserve- Reserves or resources for which tonnage and grade are computed partly from specific measurements, samples, or production data and partly from projection for a reasonable distance on geologic evidence. The sites available for inspection, measurement, and sampling are too widely or otherwise inappropriately spaced to permit the mineral bodies to be outlined completely or the grade established throughout.

Inferred reserve- Reserves or resources for which quantitative estimates are based largely on broad knowledge of the geologic character of the deposit and for which there are few, if any, samples or measurements. The estimates are based on an assumed continuity or repetition, of which there is geologic evidence; this evidence may include comparison with deposits of similar type. Bodies that are completely concealed may be included if there is specific geologic evidence of their presence. Estimates of inferred reserves or resources should include a statement of the specific limits within which the inferred material may lie.

INFISH- Interim Inland Native Fish Strategy for Intermountain, Northern, and Pacific Northwest Regions (USDA Forest Service).

Intermittent stream- A stream or portion of a stream that flows only in direct response to precipitation or seasonal run-off, and that receives little or no water from springs or other permanent sources. Unlike ephemeral streams, an intermittent has well-defined channel and banks, and it may seasonally be below the water table.

Intrusive- A body of igneous rock that has pushed into older rock.

Irretrievable commitments- Losses of production or use for a period of time.

Irreversible commitments- Permanent or essentially permanent resource uses or losses that cannot be reversed, except in the extreme long term.

Issue- A public or agency concern about a specific action or area that is addressed in the NEPA process.

Key watershed- A watershed that has been designated as critical to long-term persistence of regionally important bull trout populations.

Landform- A natural feature of the land surface such as a mountain, valley, or ridge.

Landslide-prone- Land that has a probability of mass movement greater than or equal to 10 percent during a period of 100 years.

Landtype- A portion of the landscape resulting from geomorphic and climatic processes with defined characteristics having predictable soil, hydrologic, engineering productivity, and other behavior.

Large Woody Debris (LWD)- Snags, fallen trees, and decaying logs and large limbs distributed across the forest floor that are larger than three inches in diameter and a length greater than six feet. Also referred to as coarse woody debris.

Latite- An extrusive igneous rock having less quartz than rhyolite.

Macroinvertebrates- Any animal lacking a backbone and generally visible to the unaided eye. In rivers and streams they include aquatic insects, mussels, and crabs.

Management Indicator Species (MIS)- Representative species whose habitat conditions or population changes are used to assess the impacts of management activities on similar species in a particular area. MIS are generally presumed to be sensitive to habitat changes.

Mature timber- Trees that have attained full development, particularly height, and are in full seed production.

Mesothermal- Formed at intermediate temperature (175 – 300 degrees C.) and pressure (4,000 – 12,000 feet depth).

Metamorphic- A type of rock that has been altered in composition, texture, or internal structure by pressure, heat, or the introduction of new chemical substances.

Metasediments- Partially metamorphosed sedimentary rocks.

Mineral entry- The filing of a mining claim on federal land to obtain the right to mine any locatable minerals it may contain. The filing for a mill site on federal land for the purpose of processing off-site locatable minerals.

Mineralization- The process of mineral formation and deposition.

Minimum tool- The least impactive method, equipment, device, force, regulation, practice, or use that will meet the management objective in a wilderness context.

Mitigation- Actions that avoid, minimize, reduce, eliminate, or rectify impacts from management practices.

Mixed-metal veins- Veins having gold as the primary ore mineral, and silver, copper, lead, and/or zinc as byproducts.

Monitoring- The process of collecting information to evaluate if objectives and anticipated results of a management plan are being realized, or if implementation is proceeding as planned.

National Forest System road- A classified forest road under the jurisdiction of the Forest Service. The term "National Forest System road" is synonymous with the term "forest development road" as used in 23 U.S.C. 205.

National Wilderness Preservation System- All lands managed under the Wilderness Act and subsequent wilderness designations, irrespective of the department or agency having jurisdiction.

Native plant- A plant native to a specific region where it grows naturally and where it evolved before the arrival of European settlers in the late 1700s.

Naturalized- A plant that is not native to an area but has colonized new areas in which it is not native.

NEPA (National Environmental Policy Act)- An abbreviation for the National Environmental Policy Act of 1969, which requires environmental analysis and public disclosure of federal actions.

New road construction- Activity that results in the addition of forest classified or temporary road miles (36 CFR 212.1).

NHPA (National Historic Preservation Act)- A Federal Act, passed in 1966, which established a program for the preservation of additional historic properties throughout the nation and for other purposes, including the establishment of the National Register of Historic Places, the National Historic Landmarks designation, regulations for supervision of antiquities, designation of the State Historic Preservation Offices (SHPO), guidelines for federal agency responsibilities, technical advice, and the establishment of the Advisory Council on Historic Preservation.

NHRP (National Register of Historic Places)- A list of cultural resources that have local, state, or national significance maintained by the Secretary of the Interior.

No action (alternative)- The most likely condition expected to exist if current management practices continue unchanged. The analysis of this alternative is required for federal actions under NEPA.

Non-discretionary actions- Land management activities initiated from outside the National Forest Service, such as mining proposals, special-use permitted activities, or suppression tactics for life-threatening situations.

Non- native plant- A plant that arrived since the time of European contact.

Non-signficant amendment- A one-time, project-specific amendment to Agency management direction such as the Forest Plan. The amendment allows project management to deviate from Agency management direction, but the deviation is not expected to cause long-term, major effects to the expected outcomes of that direction.

Non-system road-

Notice of Intent (NOI)- A notice that an Environmental Impact Statement (EIS) will be prepared and considered.

Noxious weed- A state-designated plant species that causes negative ecological and economic impacts to both agricultural and other lands within the state.

Nutrient cycling- Circulation or exchange of elements such as nitrogen and carbon between non-living and living portions of the environment. Includes all mineral and nutrient cycles involving mammals and vegetation.

Old growth- Mixed conifer or grand fir stands having at least 37 trees per hectare (15/acre) more than 53 centimeter (21-inch) diameter at base height (d.b.h.), an average of 1.2 or more snags per hectare (0.5/acre) more than 53 centimenter (21 inch) d.b.h/, two or more canopy levels, more than 70 percent crown closure (overstory plus understory), and some trees with heart rot.

Ore mineral- A mineral that carries the valuable metallic constituents of a deposit.

Oxidized zone- The near-surface portion of an ore body in which sulphide minerals have been converted to oxides by groundwater.

PACFISH- Interim strategies for managing Pacific anadromous fish-producing watersheds in eastern Oregon and Washington, Idaho, and portions of California. Direction for managing habitat for spring/summer chinook salmon, and steelhead.

Patented - A patented mining claim is one in which the Federal Government has passed its title to the claimant, giving him exclusive title to the locatable minerals and, in most cases, the surface and all resources.

Perennial stream- A stream that typically maintains year-round surface flow, except possibly during extreme periods of drought. A perennial stream receives its water from springs or other permanent sources, and the water table usually stands at a higher level than the floor of the stream.

Permeability- The capacity for transmitting a fluid.

Pit toilet- a temporary hand dug pit used as a toilet facility that usually has a self-standing tent for the toilet covering.

Pluton- A body of igneous rock that solidified beneath the earth's surface.

Porphyry- A rock in which large mineral crystals are contained in a finer-grained matrix.

Potential Vegetation Group (PVG)- Potential vegetation types grouped on the basis of a similar general moisture or temperature environment.

Priority watershed- Governor's Bull Trout Conservation Plan (7/96) - A watershed that is either in the best condition for this species or is most recoverable with the greatest opportunity for success. Priority watersheds can be classified as follows:

Production- Stage of mining activity that involves the mining, removal, and processing of the discovered and developed ore deposit and marketing a product (e.g., concentrates, dore, bullion, etc.).

Proposed action- A proposal made by the Forest Service to authorize, recommend, or implement an action to meet a specific purpose and need.

Prospecting- The preliminary stage of mining activity that involves searching for outcrops or surface exposures of mineral deposits. It is usually characterized by low impact surface uses, such as driving on existing roads, hiking or riding on trails or cross country, taking of small samples by hand or with small highly portable tools, field mapping, use of portable geophysical equipment, stream sediment sampling, panning of placer samples or small scale sluicing, soil sampling, geologic reconnaissance mapping, and claim staking.

Pyrite- An iron sulfide mineral.

Quartz- A silicon dioxide mineral common in many rocks.

Quartzite- A granular metamorphic rock consisting almost entirely of quartz.

Reasonably incident- This refers to any use of the National Forests for purposes that reflect sound practices necessary or required for the various stages of mining activities, including prospecting, mining, or processing operations. For a use to be reasonably incident, the type and level of use must be justified as being appropriate to the stage of mining activity in which the operation is legitimately engaged (i.e., prospecting, exploration, development, production, abandonment, or reclamation). In turn, the stage of mining activity with the related use must be required, justified, and appropriate, based on the nature and extent of the mineral resource present.

Reclamation (mine facilities)- Reclamation can include removing facilities, equipment, and materials; recontouring disturbed areas to near pre-mining topography; isolating and neutralizing, or removing toxic or potentially toxic materials; salvage and replacement of topsoil, and/or seedbed preparation, and revegetation.

Resident fish- Fish that are non-migratory and spend their entire life cycle within a given freshwater area.

Rhyolite- An extrusive igneous rock having a similar chemical composition to granite.

Riparian Habitat Conservation Area (RHCA)- An area designated for special protection or management emphasis under PACFISH. Includes wetlands, streams, bogs, seeps, springs, lakes, landslide-prone areas, and the buffer zones protecting these areas.

Riparian areas or zones- Terrestrial areas where the vegetation complex and microclimate conditions are products of the combined presence and influence of perennial and/or intermittent water, associated with high water tables, and soils that exhibit some wetness characteristics.

Road- A motor vehicle travelway over 50 inches wide, unless designated and managed as a trail. A road may be classified, unclassified, or temporary.

Road construction- Building a new road.

Road decommissioning- Activities that result in the stabilization and restoration of unneeded roads to a more natural state (36 CFR 212.1, FSM 7703).

Road maintenance- The ongoing upkeep of a road necessary to retain or restore the road to the approved road management objective (FSM 7712.3).

Road maintenance level- Road maintenance is classified in terms of the following levels:

maintenance level 1	Assigned to intermittent service roads during the time they are closed to vehicular traffic. Basic custodial maintenance is performed to keep damage to adjacent resources to an acceptable level and to perpetuate the road to facilitate future management activities.
maintenance level 2	Assigned to roads open for public or permitted use by high clearance vehicles. Passenger car traffic is not a consideration.
maintenance level 3	Assigned to roads open and maintained for travel by a prudent driver in a standard passenger car. User comfort and convenience are not considered priorities.
maintenance level 4	Assigned to roads that provide a moderate degree of user comfort and convenience at moderate travel speeds. Some roads may be paved and/or dust-abated.
maintenance level 5	Assigned to roads that provide a high degree of user comfort and convenience. These roads are normally paved.

Road reconstruction- Activity that results in improvement or realignment of an existing classified road as defined below:

a. **Road Improvement** – Activity that results in an increase of an existing road's traffic service level expansion of its capacity, or a change in its original design function.

b. **Road Realignment** – Activity that results in a new location of an existing road or portions of an existing road and treatment of the old roadway (36 CFR 212.1).

Roof- The top of a pluton.

Roof pendant- A body of older rock projecting down into the top of a batholith.

Rosgen stream type- A classification system developed to characterize natural streams. Characteristics include slope, gradient, channel substrate, sinuosity, entrenchment, and width/depth ratio.

RS 2477 claim- A claim for a pre-existing road right-of-way based upon a mining law passed in 1866. The law was later repealed as a part of the Federal Land Policy and Management Act (FLPMA) of 1976.

RVD (Recreation Visitor Day)- Twelve hours of recreation use in any combination of persons and hours (one person for 12 hours, three persons for four hours, etc.).

Scoping- A process defined by the National Environmental Policy Act and used by the Forest Service to determine through public involvement, the range of issues that the planning process should address.

Sedimentation- The action or process of forming and depositing sediments. Stream sedimentation occurs when water velocity cannot transport the bed load and suspended matter is deposited by gravity along the streambed.

Sensitive species- Sensitive plant and animal species are selected by the Regional Forester or the BLM State Director because population viability may be a concern, as evidenced by a current or predicted downward trend in population numbers or density, or a current or predicted downward trend in habitat capability that would reduce a species' existing distribution. Sensitive species are not addressed in or covered by the Endangered Species Act.

Seral- The unique characteristics of a biotic community that is a developmental, transitory stage in an orderly ecological succession involving changes in species, structure, and community processes with time.

Sericite- A fine-grained white mica. Often occurs as a hydrothermal alteration mineral.
shear zone. An area of faulting where rock has shattered across a wide belt rather than a single plane.

Silicify- The replacement of a rock with silica.

Snag- A standing dead tree. The interior of the snag may be sound or rotted.

Soil- A dynamic natural body on the surface of the earth in which plant grow; it is composed of mineral, organic, and living materials.

Soil compaction- Compaction is a physical change in soil properties that results when pore spaces are reduced in size and soil becomes denser. Compaction generally occurs when a load is applied to the soil, such as when heavy equipment makes several passes that compress the soil. For Forest management, soils are considered to be detrimentally compacted when there is a 10-12 percent reduction in soil porosity. Because porosity is difficult to measure, soil bulk density is typically used as a surrogate. See (FSH 2509.18) for relationship between soil porosity and soil bulk density).

Soil displacement- the movement of soil from one place to another by mechanical forces such as digging, blade pushing, wheels or hooves churning, or logs being dragged.

Soil erosion- Soil erosion is the detachment and transport of soil particles or aggregates by wind, water, or gravity. Management practices may increase soil erosion hazard when they remove ground cover and detach soil particles.

Spawning- The act of fish reproduction. The mixing of the sperm of a male fish and the eggs of a female fish.

Special use authorization- A permit, term permit, lease, or easement that allows occupancy or use rights or privileges on National Forest System lands (36 CFR 261.2).

Special use permit- A special use authorization that provides permission, without conveying an interest in land, to occupy and use National Forest System lands or facilities for specific purposes, and which is both revocable and terminable.

Species of concern- An unofficial status for a species whose abundance is at low levels.

Sphalerite- The primary ore mineral of zinc.

Stability Index Mapping (SINMAP)- a computer program that implements the computation and mapping of a slope stability index based on geographic information, primarily digital elevation data. SINMAP has its theoretical basis in the infinite plane slope stability model with wetness obtained from a topographically based steady state model of hydrology. These components are combined with an accounting for parameter uncertainty to define the stability index. The SINMAP model uses landslide initiation points in GIS to calibrate input parameters to the model. The SINMAP model was used to predict "areas prone to rapid soil mass movements typified by shallow, non-cohesive soils on slopes where shallow translational landsliding phenomena are controlled by shallow groundwater flow convergence."

State Historic Preservation Officer (SHPO)- A person appointed by a state's governor to administer the State Historic Preservation Program.

Strata (minerals)- Sections of a formation that have distinctly different rock types.

Strata (forested vegetation)- Groups of stands that are relatively homogeneous in age, productivity, and density.

Stratigraphic nomenclature- Classification system for layered (sedimentary) rocks.

Strike- The direction of the linear intersection of an inclined planar structure with a level surface.

Stringer- Irregular filament of ore.

Strongholds (fish)- Watersheds that: (1) include all major life-history forms (resident, fluvial, adfluvial) of fish that historically occurred there; (2) have fish numbers stable or increasing, with local populations at least half of their historical size; and (3) have populations with at least 5,000 individuals or 500 adults.

Subbasin- A fourth field hydrologic unit that nests within the hierarchical system developed by the U.S. Geological Survey to describe watersheds. Typically 800,00 to 1,000,000 acres in size, a

subbasin is smaller than a river basin (third field unit), and larger than a watershed (fifth field unit).

Substrate- The streambed that is composed of mud, sand, gravel, and/or boulders.

Subwatershed- A subdivision within a watershed.

Summer Range- The area essential for big game to carry out their reproductive cycles.

Surface Use Analysis- investigative report conducted by certified mineral examiners that provides information, recommendations, and conclusions about the reasonableness and justification for the proposed mining operation.

Talus- Rock debris at the base of a cliff or slope.

Tetrahedrite- An ore mineral of copper and silver.

Thalweg- The deepest portion of a stream channel.

Thermal cover- Cover used by animals to ameliorate effects of weather; for elk, a stand of coniferous trees 40 feet or taller with an average crown closure of 70 percent or more.

Threatened species- Designated by the U.S. Fish and Wildlife Service or National Marine Fisheries Service; a plant or animal species given federal protection because it is likely to become endangered throughout all or a specific portion of its range within the foreseeable future.

Total Soil Resource Commitment (TSRC)- the conversion of a productive site to an essentially non-productive site for a period of more than 50 years. Examples include system or non-system roads, inadequately restored haul roads, designated skid roads, landing areas, and some stock driveways. Productivity on these areas ranges from 0 to 40 percent of natural.

Trace element- An element present in minor amounts in the earth's crust.

Trail- A pathway for purposes of travel by foot, stock, ski, snowshoe, or trail vehicles.

Unclassified road- Roads on National Forest System lands that are not managed as part of the forest transportation system, such as unplanned roads, abandoned travelways, and off-road vehicle tracks that have not been designated and managed as trails. Unclassified roads also include those roads that were once under permit or other authorization and were not decommissioned upon the termination of the authorization (36 CFR 212.1).

Understory- The trees and other woody species growing under a more-or-less continous cover of branches and foliage formed collectively by the upper portion of adjacent trees and other woody growth.

Viable population- A population that is regarded as having the estimated numbers and distribution of reproductive individuals to ensure that it will continue to exist over time and will be well distributed within a given area.

Vein- A rock fissure filled with a mineral deposit; usually steep to vertical in orientation.

Volcanics- Igneous rocks that have been extruded onto the earth's surface.

Water Erosion Prediction Project (WEPP)- The WEPP model is a process-based, distributed parameter, continous simulation, erosion prediction model for use on personal computers running Windows 95/98/NT/2000 or DOS. The current model version (v2001.300) available for download is applicable to hill slope erosion processes (sheet and rill erosion), as well as simulation of the hydrologic and erosion processes on small watersheds.

Water quality- Refers to the chemical, physical, or biological characteristics that describe the conditions of a river, stream, or lake.

Water Quality Limited (WQL) water bodies- Denotes streams or other water bodies not meeting state Water Quality Standards. For purposes of Clean Water Act listing, these are waters that will not meet standards even with application of required effluent limitations.

Waterbar- An earthen barrier across a road or skidtrail used to divert water and reduce erosion. It is usually designed to allow limited vehicle passage.

Watershed- Region or area drained by surface and groundwater flow in rivers, streams, or other surface channels. A smaller watershed can be wholly contained within a larger one, as watersheds are hierachal in structure.

Wetlands- Land areas that are wet at least for part of the year, are poorly drained, and are characterized by hydrophytic vegetation, hydric soils, and wetland hydrology. Examples of wetlands include swamps, marshes, and bogs.

Wilderness areas- Areas that are without developed and maintained roads, and that are substantially natural, and that Congress has designated as part of the National Wilderness Preservation System.

Winter range- An area or areas where animals (usually ungulates such as elk, deer, bighorn sheep) concentrate due to favorable winter weather conditions. Conditions are often influenced by snow depth, and the availability or forage and thermal cover.

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APPENDIX A. CUMULATIVE EFFECTS

Contents

Cumulative Effects

Background

According to the Council on Environmental Quality's regulations for implementing NEPA (50 CFR§1508.7), an action may cause cumulative impacts on the environment if its effects overlap in space or time, with the effects of other past, present, or reasonably foreseeable future actions, regardless of the agency, company, or person undertaking the action. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time.

Analysis of each type of cumulative effect must consider past, present, and reasonably foreseeable future actions (temporal component), and actions that may be separated by distance (spatial component) if there is the potential for incremental effects of some magnitude.

The spatial scope of analysis for cumulatively affected resources is defined by the physical limits or boundaries of (1) the Golden Hand Mine project's effects on the resources; and (2) the contributing effects from other non-project activities within the watersheds where the project occurs. Actions may affect some of resources differently, hence the spatial scope of analysis for each of the resources may vary.

The temporal scope of analysis for cumulative effects includes past, present, and future actions and their effects on each resource. For the purpose of this analysis, the temporal scope will look 10 years into the future, because this is the length of the operating plan proposed by AIMM. The assessment of future actions is limited to actions that are reasonably foreseeable. Existing conditions, not historical conditions, are the baseline for comparison of alternatives. Past actions provide a historical context from which the existing conditions have developed.

In order to present the cumulative effects analysis in a clear manner that promotes understanding of the complex issues, the descriptions in this section have been organized along the following format. For each resource area, a non-project action and effect is identified, the related project action and effect is identified, then the resulting incremental effect is described.

Non-project Action/Effect	+	Project Action/Effect	=	Cumulative Social, Biological, or Physical Effect

Analysis Area

For most resources the analysis area for cumulative effects is contained within the Beaver-Gold and Upper Big Creek watersheds (5th level HUCs) (see Figure 3-11, Chapter 3). The Beaver-Gold Watershed occurs entirely in the FC-RONR Wilderness and includes Coin Creek, Beaver Creek, and lower Big Creek. The Upper Big Creek Watershed contains approximately 700 acres of private land and includes Smith Creek, Logan Creek, and Upper Big Creek.

Two resources (Wilderness and Cultural Resources) analyzed cumulative effects across the entire FC-RONR Wilderness.

Affected Environment

Activities that could have cumulative effects with the Golden Hand Mine project include actions on federal, state, and private lands. Federal activities are primarily ongoing and potential Forest Service actions on NFS lands and are summarized in Table A-1. Ongoing and future actions on state and private lands include mining on patented land, subdivision and residential development of private land, water diversions/withdrawals, tourist/guest ranch businesses, recreational use, and road construction, maintenance and use.

The Upper Big Creek Watershed (5th level HUC) has several parcels of private land as well as several State school sections (undeveloped) and other Fish and Game owned land. This land is minimally developed, and further development is likely to occur at a slow rate, if at all. All of the private land could be subject to further subdividing. Private land owners are entitled to the right of reasonable access under the Alaska National Interest Lands Conservation Act (ANILCA). Private landowners harvested timber and reconstructed roads from the old "Sunday Mine" property in 1995-1997. Inactive mining claims of 100-200 acres each are located at the Independence, Sunday, and Moscow Mines. There are no known future mining activities on these lands. Five undeveloped sections of land are State-owned.

While future development and even full scale mine operation of the Golden Hand lode mining claims are possible if enough ore is discovered to make it economically feasible, this action was not considered reasonably foreseeable within the next 10 years based on the proposed plan of operations submitted by AIMM. Also based on other information (some of which is summarized in the Surface Use Aanalysis), the likelihood of a full-scale mine operation was considered relatively speculative. Because Alternative D did not consider as much pre-development work as Alternative B (i.e., no trenches), some of the activities under B were considered to be reasonably foreseeable to Alternative D.

Table A-1. Ongoing and Reasonably Foreseeable Federal Actions in the Upper Big Creek (UBC) and Beaver-Gold Watersheds (BG)

Federal Actions in Upper Big Creek Watershed and Beaver-Gold Watersheds			
Federal Actions	**Reference**	**Description**	**Resource Affected**
Roads and Access Management			
Road Maintenance (ongoing in UBC)	Faurot 1994; Wagoner, 1998b, 1998c, 2001	About 1/3 roads located within RHCAs. Most are native-surfaced roads, occasionally maintained, receive use by miners, hunters, and the general public. Some roads are largely bedrock, others have unstable cut and fillslopes, and uncontrolled road surface drainage. Maintenance requires improvements with mitigations to protect fish. Previous BAs require road evaluations.	Soil & Water, Fisheries, Roads & Access Mgmt
Travel Plan (coordinated w/ Valley County) (proposed in UBC)	Faurot 1994; Wagoner, 1998b, 1998c, 2001	FS commitment to redo travel plan following FP Revision in 2003. BAs require fish surveys to identify conflicts and close affected reaches to recreational boating & floating from April to June, Fording of Big Creek may adversely affect fish – ford is scheduled to be replaced by a bridge.	Soil & Water, Fisheries, Roads & Access Mgmt
Special Use Permits			
Water diversions (ongoing in UBC)	Faurot 1994; Wagoner 1998a, 1998b, 1998c, 2001	Six water diversions (0.04-1.6 cfs), 4 to be reissued in 2003. Needs include screen intake pipe, repair any leaks in line, build pipe system for overflow, stabilize channels and eroded area by the collection tank, reconstruct diversions to measure flow.	Soil & Water, Fisheries
SUP Hydro (ongoing in UBC)	Wagoner 1998a, 1998c	Permitting of 3 residential, small-scale hydroelectric operations (0.4-0.9 cfs). Outstanding and completed fish improvements include improve roads & install additional waterbars, replace existing rock diversion w/permanent screened structure with headgate to divert only permitted amount of water	Soil & Water, Fisheries
Big Creek Lodge (ongoing in UBC)	Wagoner 1998c	Operation of lodge including guest cabins and outbuildings	None
Recreation Management			
Big Creek Guard Station operations & maintenance (ongoing in UBC)	Wagoner 1998a, 1998c	Operation and maintenance of NFS administrative site.	None
Big Creek airport campground operations & maintenance (ongoing in UBC)	Wagoner 1998a, 1998c	Operation and maintenance of campground at Big Creek airport	None
Big Creek airstrip operation & maintenance (ongoing in UBC)	Wagoner 1998a, 1998c	Operation and maintenance of backcountry airstrip at Big Creek.	None

Federal Actions in Upper Big Creek Watershed and Beaver-Gold Watersheds			
Federal Actions	**Reference**	**Description**	**Resource Affected**
Cabin Creek airstrip operations & maintenance (ongoing in BG)		Operation and maintenance of backcountry airstrip at Cabin Creek. Proposed use of wheelbarrows for maintenance.	Wilderness
Soldier Bar airstrip operations & maintenance (ongoing in BG)		Operation and maintenance of backcountry airstrip at Soldier Bar. Potential use of motorized/mechanized equipment and transport to assist in maintenance activities.	Wilderness
Trails inspection/ Recreation site maintenance (ongoing)	Faurot 1994; Wagoner 1998b	Inspection for trails and trailheads and inventories for impacts to fish and fish habitat. Maintenance of dispersed campsites, recreation sites. Restrict camping in Smith Creek riparian areas	Soil & Water, Fisheries, Cultural, Wilderness
Outfitters & Guides (ongoing)	Faurot 1994, Wagoner 1998c, 2001	Provide public with outfitted and guided recreation opportunities (see recreation). Activities include long term temporary camps, use of packstock. Fish surveys required in BA.	Soil & Water, Fisheries, Cultural, Wilderness
Wilderness Research			
Monitoring and Research (ongoing)		May involve use of motorized and mechanized transport and equipment and permanent structures.	Wilderness
Minerals Management			
Fourth of July Mine (ongoing in UBC)	Faurot 1994; Wagoner, 1998c, 2001	Approved plan of operations (1989) for small mine in the Government Creek drainage. Maintenance of water bars and roadside ditches.	Soil & Water, Fisheries, Minerals
Velvet Quartz Mine (ongoing in UBC)	Faurot 1994; Wagoner 1998a, 1998c, 2001	Approved plan of operation (1984) for small-scale underground mine and above ground mill up North Fork of Smith Creek. Largely inactive since 1996. Mitigation measures include recontouring and vegetation, slash filter windrow below new pond, placing fuel in lined containment (No fuel present in summer 2002)	Soil & Water, Fisheries, Minerals
Walker Millsite (ongoing in UBC)	Faurot 1994, 2002; Wagoner 1998a, 1998c	Plan of operations approved in 1990 includes 50 ton per day ball mill and gravity milling process; a 50' by 100' by 7' deep tailings pond, 1000' of access road; a water transmission line, and explosives storage shed. Operating plan amended in 2002 to allow relocation and temporary operation of a carbon-in-pulp (CIP) cyanide vat leach plant from private land to millsite. Mitigation measures include overflow pipe, fuel containment, adherence to state cyanidation permit requirements, spill plan, tank and vat screening.	Soil & Water, Fisheries, Minerals
Forest Products			
Firewood Harvest (ongoing in UBC)	Wagoner 1998b, 1998c, 2001	Removal of firewood for non-commercial use. Adherence PACFISH RHCAs for activities.	Soil & Water, Fisheries, Wildlife
Habitat Improvement & Mitigation Measures			
Noxious weed control (ongoing)	Faurot 2002, Wagoner 2001	Treatment of noxious weeds including mitigation measures such as buffers, weather restrictions, herbicide and equipment handling, specific chemical authorization, project oversight.	Soil & Water, Fisheries, Wildlife

Federal Actions in Upper Big Creek Watershed and Beaver-Gold Watersheds			
Federal Actions	**Reference**	**Description**	**Resource Affected**
Watershed & fish habitat improvement (ongoing in UBC)	Wagoner 1998b, 1998c, 2001	• Water control devices, mulch, erosion control, revegetation, fertilizer for construction in RHCAs or slope >45%. • Fish habitat & riparian sampling	Soil & Water, Fisheries, Wildlife
Golden Hand Plan and related activities			
Trenches and additional drill sites at Golden Hand Nos. 3 & 4 (proposed in BG)	Golden Hand Lode Mining Claims Nos. 3 & 4 DEIS, USDA 2003	The descriptions of development under Alternative . B and C are reasonably foreseeable extensions of Alternative D if sufficient geologic information is found.	All under Alternative D of EIS
Exploration work at Golden Hand lode mining claims Nos. 1 & 2 (proposed in BG)	Ivy 2002d	**Claim # 1:** Access on FS Trail #013 from Pueblo Summit across Coin Creek and northward to the Ella Portal using the minimal roadwork, including clearing sluff, downed trees and other impeding obstacles, water bars installed if needed. Roadwork and use of old roadbeds on claim, if necessary. Open caved Ella Portal using a John Deere 450 back/hoe loader, collect mineral samples. Place waste rock on existing waste dump outside of the Ella Portal. Use a Caterpillar Bulldozer 2U and Austin Western Road grader 99h (or equivalents) to clear the road. **Claim #2:** Lies primarily on a steep hillside covered with overburden and thick timber growth. Surface sampling of soils and rocks at a level that does not require an operating plan to minimize the number of future trenches required. Extend roads undetermined distance to reach unidentified trench targets. Trench to expose strike length covered by rock. Clear an existing road in good condition, leading from claims #3 and #4 access road to the Penn Ida Adit on claim #8 to point of a second switchback. Clear road sluff, and downed trees and other obstacles using equipment described above. Proposed road extensions within boundaries of claim #2 and old claim #5. May use compressor and drill in the trench. Mitigation measures for new roadwork within 50 feet of a creek may include install sediment control fencing. Fill trenches at end of the validity process. Welcome any suggestions FS may have on protective and mitigation measures that should be undertaken in conjunction with this work.	All

Table A-1. Ongoing and Reasonably Foreseeable Non-federal Actions in the Upper Big Creek (UBC) and Beaver-Gold Watersheds (BG)

Non-Federal Actions	Date	Description	Resources Affected
Road construction, maintenance and use	Ongoing UBC	Road construction and maintenance by private landowners on private lands. Road maintenance by Valley County on roads asserted to be county roads. Many roads are adjacent to or ford streams. Work may not include measures to minimize sedimentation into streams.	Soil & Water, Fisheries, Roads & Access Mgmt
Subdivision and residential development of private land	Ongoing UBC	Development on private lands must meet county regulations for sanitation but can occur near to streams.	None
Water diversions/ Withdrawals	Ongoing UBC	Unknown amount of water diverted from water diversions on private land.	Fisheries
Tourist/guest ranch businesses	Ongoing UBC	Unknown amount of tourist-related business located on private lands.	None
Recreational use	Ongoing	Camping, hiking, backpacking, riding, fishing, hunting, sightseeing and associated activities.	Soil & Water, Fisheries, Roads & Access Mgmt, Wilderness
Timber harvest	Ongoing UBC	Small scale harvest of trees off private land generally for personal use	None
Noxious weed control	Ongoing UBC	Localized and limited on private lands, probable that no buffers or weather restrictions are employed	Noxious weeds
Mining on patented land	Ongoing UBC	Campbird Mine located on private land in Logan Creek drainage.	Mining
Taylor Ranch operations and maintenance	Ongoing BG	Taylor Ranch Field Campus in Wilderness includes the ranch facilities, research activities, pasture and airstrip.	Wilderness
Legal hunting	Ongoing	Hunting of legal game animals regulated by the State of Idaho.	Wildlife
Legal fishing	Ongoing	Angling for legal fish species regulated by the State of Idaho.	Soil & Water, Fisheries, Roads & Access Mgmt
Legal trapping	Ongoing	Legal trapping as regulated by the State of Idaho.	Wildlife
Tribal subsistence and ceremonial activities	Ongoing	Nez Perce Tribe subsistence and ceremonial activities.	None

APPENDIX B. SURFACE USE ANALYSIS

UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE

Surface Use Analysis of the Plan of Operations

on the

Golden Hand #3 and #4 Lode Claims

Lands Involved:

Certain lands within Section 26, T. 22 N., R 9 E., BM,
Frank Church-River of No Return Wilderness, Payette National Forest

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on the

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INTRODUCTION

Need for Report

The Krassel Ranger District, Payette National Forest, received on April 16, 1996, a proposed plan of operations (POO) for mining activity from American Independence Mines and Minerals, Inc. (AIMM). The proposal covers drilling, trenching, and underground work and ancillary activity on the Golden Hand #3 and #4 lode claims located in the Frank Church-River of No Return Wilderness, Valley County, Idaho

Under Federal Court order, the Forest is preparing an Environmental Impact Statement (EIS) to assess the impacts associated with the mining plan that would create significant disturbance to surface resources within the wilderness.

The Forest has requested an analysis of the plan and recommendations as to what level of surface use is warranted in view of what is known about the deposit; in the context of a Department of Interior decision that establishes valid existing rights on the two mining claims; and in view of Forest Service regulatory responsibilities to ensure that all mining operations shall be conducted so as, where feasible, to minimize adverse environmental impacts to National Forest surface resources. The analysis is based on available information submitted by AIMM and in the files of the Payette National Forest.

Statutory and Regulatory Background

The Surface Resources Act of July 23, 1955, (30 USC 611, *et seq.*) provides limitations on the use of the surface of mining locations on lands open to operations under the General Mining Law (30 USC 22, *et seq.*). Section 4 of the Act directs that any unpatented mining claim "...... shall not be used, prior to issuance of patent therefor, for any purposes other than prospecting, mining or processing operations and uses reasonably incident thereto."

Activity or facilities that are "reasonably incident" will vary depending on the stage of mining activity. Through case law that has evolved since 1955, the reasonably incident standard has been interpreted to include only activity or facilities that are an integral, necessary, and logical part of an operation whose scope justifies the activity or facilities.

Activities that are "reasonably incident" would be expected to be closely tied to, and be defined within, what would be reasonable and customary for a given stage of mining activity. Such levels of activity would include initial prospecting, advanced exploration, predevelopment, and actual mining. Each stage is defined by an increasing level of data and detail on the mineral deposit that, in total, contribute to an increasing probability that the deposit can be mined profitably. Each stage also has an increasing impact on the land.

While Congress restricted use of the surface on unpatented claims to uses "reasonably incident" to mining, in 1974 the Secretary of Agriculture promulgated regulations applicable to processing proposals for use of the surface that is reasonably incident to mining on National Forest system lands. All mining activity on National Forest System lands open to operations under the General Mining Law, regardless of the nature and extent, are administered by the Forest Service through these mining regulations at Volume 36 of the Code of Federal Regulation, Part 228 A (36 CFR 228A). Part 36 CFR §228.8 specifically requires that "All operations shall be conducted so as, where feasible, to minimize adverse environmental impacts on National Forest surface resources ...". The regulations were promulgated in part under authority of the Forest Service Organic Act (16 USC 473, *et seq.*) that, among other things, directed the Secretary of Agriculture to make such rules on forest land as necessary "to regulate their occupancy and use and to preserve the forests thereon from destruction...".

Forest Service mining regulations require that mining-related activities that would create significant disturbance to surface resources be authorized by an approved plan of operations. Any significant surface resource disturbance, whether on a mining location or not, that is not authorized by an approved plan of operations is prohibited by regulations at 36 CFR Part 261. Federal law at 16 U.S.C 551 requires compliance with these regulations of the Secretary of Agriculture.

Mining activity in lands managed under the Wilderness Act of 1964 (16 USC 1121, *et seq.)* is allowed within a framework that is partly statutory and partly guided by case law. Language in the Act, and in subsequent Acts designating additional wilderness areas, allows certain activities that would otherwise be in nonconformance subject to "valid existing rights". In regard to mining activity, "valid existing rights" are recognized when there is a discovery of a valuable mineral deposit under the 1872 Mining Law, as amended (30 USC 22, *et seq.*).

The Golden Hand #3 and #4 lode claims have been declared valid by virtue of a Department of Interior, Interior Board of Land Appeals (IBLA), decision that was not further adjudicated (IBLA, 1992). Thus, valid existing rights were established and the claimant has the right to pursue development of the deposit on the claims.

In view of Congressional intent in establishing wilderness areas as unique management units, it is appropriate to ensure under the Forest Service Organic Act, the Surface Resources Act of 1955, and Forest Service mining regulations that uses of the surface associated with the proposed plan are reasonably incident to mining and, where feasible,

are conducted in a manner that minimizes adverse environmental impacts to surface resources.

Case History

The administrative record on the Golden Hand Claim group is lengthy. The general background events leading to the need to prepare the Environmental Impact Statement on AIMM's POO are briefly summarized as follows:

- In March 1985, AIMM submitted a mining plan of operations calling for significant disturbance to surface resources on the Golden Hand Nos. 1-8 lode claims in the Frank Church-River of No Return Wilderness

- The Forest Service conducted a mineral examination in July 1985 to determine if any of the Golden Hand claims were valid prior to processing the plan of operations.

- The mineral report was completed in November 1986. It concluded that none of the eight claims were valid and recommended to the Department of Interior that contest be initiated against all of the claims.

- AIMM timely appealed the BLM's contest notice and a hearing was held before Administrative Law Judge Ramon M. Child who ruled on January 19, 1989, that Golden Hand claims numbered 1, 5, 6, and 7 were invalid and dismissed the contest on claims numbered 2, 3, 4, and 8.

- Both parties appealed to the Interior Board of Land Appeals. On February 10, 1992, the Board affirmed Judge Child's decision that claims 1, 5, 6, and 7 were invalid and that claims 3 and 4 were valid. It reversed his decision that claim 2 was valid and remanded claim 8 back to the Hearings Division for review of the historic value of silver as it bore on the validity of claim 8. The Forest Service later dismissed its contest against claim #8.

- AIMM submitted a proposed plan of operations for work on claims #3 and #4 on April 16, 1996.

- AIMM filed suit in 1999 in Idaho Federal District Court seeking an order requiring the Forest Service to allow access to the claim group for work under the 1996 plan and for other purposes.

- On August 9, 2002, Judge B. Lynn Winmill entered orders on three points raised by AIMM. One of those ordered the Forest Service to complete the EIS and its review of the 1996 plan by May 1, 2003

Lands and Records Review

AIMM's POO proposes work on the Golden Hand #3 and #4 lode claims located in Section 26, T. 22 N., R 9 E., BM, Valley County, Idaho, entirely within the Frank

Church-River of No Return Wilderness. The wilderness was created in 1980 by the Central Idaho Wilderness Act (PL-96-312). The lands are administered by the Krassel Ranger District, Payette National Forest. The area is about 43 air miles east-northeast of the community of McCall, Idaho, and is accessible by a network of County and Forest Service Roads that lead to the wilderness boundary at Pueblo Summit. From there, an old mine road (now a Forest Service designated trail) extends about 2.7 miles into the wilderness to the Golden Hand property.

Department of Interior, Bureau of Land Management (BLM) LR2000 database queried November 14, 2002, shows that the Golden Hand # 3 and #4 lode claims were located September 11, 1979. They are serialized under IMC37365 and IMC37366, respectively. The latest assessment year is shown as 2003. The owner of record is American Independence Mines and Minerals, Inc.

Geology and Mineral Deposits

The geology and mineral deposits of the Golden Hand claim group have been discussed generally in Shenon and Ross (1936), Cater et al (1973) and Lorain (1938). Thurmond (1986) drew from those sources for discussion of the geology and mineral deposits in the Forest Service mineral report. In addition, the administrative record includes several historical reports on aspects of the Golden Hand claim group. The U.S. Geological Survey is mapping and compiling the geology of much of central Idaho's igneous and metamorphic terrane, but that work does not include significant detail in the vicinity of the Golden Hand deposit.

The general geology and mineralization of the deposit on the Golden Hand #3 and #4 claims, which was part of the Neversweat No. 2 claim in the 1930's, can be briefly summarized from Cater, et al (1973). Though the geologic framework of central Idaho has evolved over the years as more geologists studied the area, much of Cater's language remains in the administrative record and is retained as general background information in this report:

Cater et al write,

> "Principal mine workings are along the irregular and gradational contact between the Yellowjacket Formation (chiefly schist, quartzite, and argillite) and granodiorite of the Idaho batholith. The contact zone is a complex mixture of highly fractured and silicified rocks.
>
> No significant ore deposits were found during the recent Bureau of Mines investigation. Shenon and Ross (1936, p.30) described the ore zones exposed in 1933 as follows:
>
> *The ore thus far developed lay chiefly along joints and shear planes in granodiorite and schistose rocks of the Yellowjacket Formation, although a little disseminated pyrite and tetrahedrite occur in a quartz latite porphyry dike in the lower*

Neversweat tunnel. The ore minerals include pyrite, galena, sphalerite, tetrahedrite, chalcopyrite, and gold. In the ore the granodiorite and schist have been greatly fractured, and quartz, calcite, sericite, and epidote fill the fractures and form irregular bodies near them. Sulfides and gold occur in fractures in quartz and calcite and along clevage planes in calcite."

They go on to write of mine development,

> "In 1933 total development work at the Neversweat No. 2 claim consisted of two short admits, 70 and 130 feet long and two open cuts, less than 50 feet long and 25 feet wide. Most of past production apparently came from these near-surface workings ..... No ore was observed in any of the accessible Neversweat No. 2 workings, and few samples of potential ore zones assayed more than a trace gold and silver."

And with regard to the grade and occurrence of mineralization, they add,

> "Apparently, the ore occurred in small near-surface pods and zones and was relatively high grade, averaging 0.4-0.8 ounce gold per ton. Ore zones exposed by later underground work have been smaller than minable size and rarely of minable grade."

They also express two other points,

> "No production or development has been reported since 1941."
>
> "Other ore shoots, however, probably exist like those mined near the turn of the century and during the 1930's."

The latter point has yet to be verified.

The deposit on the Neversweat No. 2 claim is now covered by the Golden Hand #3 and #4 claims. The deposit is roughly centered on the open cut and underground workings referenced by Cater et al. The open cut is generally referred to as the "Glory Hole" and the deposit is simply referred to as the "Glory Hole deposit". The deposit's general configuration and mineral content, as accepted by the Interior Board of Land Appeals, differs somewhat from the historical picture.

The geologic framework of the Glory Hole deposit discussed before Judge Child (and given weight by the Board) was largely assembled by AIMM consulting geologist Patrick O'Hara, who mapped the general surface geology and conducted a geologic evaluation of the property. He summarized his work on a series of exhibits presented at the hearing. The exhibits covering the area of the Glory Hole deposit included a geologic map described in testimony as "not a true geologic map" but a "sketch map" or "reconnaissance map" and cross-sections described as "highly schematic" (Transcript, 1988, pages 383-384 and 462; hearing Exhibits C-47, C-60). The exhibits presented

O'Hara's hypothesis that the deposit is located within a generally northerly-trending geologic structure (Transcript, 1988, hearing Exhibit C-56). The deposit was delineated between two igneous dikes within a hydrothermally altered portion of O'Hara's structure characterized by much silicification. AIMM geologist William Vanderwall calculated low-grade mineral reserves from the deposit (likened to a disseminated mineral deposit) within the area bounded by the dikes.

Besides answering basic geologic and engineering questions, future exploration of the deposit must resolve one of many subjects little discussed at the hearing: the metallurgical character of any reserves in the Glory Hole deposit. That includes the influence of oxidation on the deposit. Little is presently known other than that gold apparently accompanied sulfide mineralization and that during 1932-34 gold and silver was produced from "high-grade oxidized ore" (Cater et al, 1973) Also, "Sulphides occur at the surface although in places there is considerable oxidation, particularly in the open cut." (Shenon and Ross, 1936). How and where the gold occurs, the depth and lateral extent of oxidation, and the effects of oxidation on ore-bearing minerals and the deposit in general are all important questions remaining to be answered by subsurface exploration.

The administrative record shows that since the hearing AIMM has gathered no additional information that would further expand on the geological and reserve picture accepted by IBLA. With the paucity of information on the deposit, of particular interest is the nature of the "reserves" on the property and their relationship to the sample assays. An analysis of the Glory Hole reserves, based on available information, is presented later in the section on **ORE RESERVE ANALYSIS**.

Sampling of the Glory Hole Deposit

Since the early 1980's, four people have led sampling efforts at the Glory Hole deposit: Carol Thurmond from the Forest Service and AIMM consulting geologists Morris Hubbard, Patrick O'Hara, and J. E. Morgan. The four collected samples from surface and underground exposures. Other people collected samples in the past and they are presented in the historical literature, but only the post-1980 samples were used by AIMM, and accepted by IBLA, to estimate mineral reserves.

The underground samples accepted by IBLA were taken from workings hereafter referred to as the "Glory Hole Adit Level" level (Exhibit 6). Though IBLA accepted that 62 surface and underground samples were collected and useful, one of those (Morgan's number 208) was a grab sample not useable in estimating quantitatively mineral reserves. The results of the remaining 61 samples are shown in Exhibit 5. From the assay results on the samples, IBLA accepted that the average mineral grade of the deposit as presented by AIMM geologist Vanderwall is 0.054 ounces per ton gold (opt Au, or simply opt for shorthand). It is that mineral grade that AIMM consultant Larry Mashburn used in his economic analysis (Mashburn, 1988).

The mineral grade was calculated as a simple arithmetic average (Transcript. 1988 p. 585). It compares favorably with the arithmetic average grade of 0.055 opt calculated for Exhibit 5. The weighted average mineral grade shown in Exhibit 5, however, is 0.048 opt and is more likely representative of the actual average of the sample data because it takes into account the length of the various samples. Vanderwall did not compute his average by weight because, for some reason, he said he could not use Morgan's sample data (Transcript, 1988, p. 586).

Most of the surface and underground sample sites are at, or close to, the same elevation. Consequently, most of the sampling data reflect a two-dimensional data array. The post-1980 samples and their connection to mineral reserves are discussed later in the section on **ORE RESERVE ANALYSIS.**

ANALYSIS OF SELECTED PLAN ELEMENTS

AIMM's POO proposes drilling, trenching, and underground work and ancillary activity intended "to further develop the Glory Hole ore body" on claims #3 and #4 (Exhibit 1). The only reserves known on those claims are associated with that deposit as accepted by IBLA. The precise locations of AIMM's proposed activities on the claims, described variously as "development" and "production" oriented, are somewhat tenuous because the actual acreage, orientation, and dimensions of the claims are not clearly defined and claim corners have yet to be accurately located (Carver, 2002). That is expected to be corrected next field season when AIMM completes a new base map that " .... would allow Forest Service personnel to orient and re-orient themselves to the basic landmarks on the two claims ....". (Ivy, 2002).

The map prepared by the Payette National Forest for the Draft Environmental Impact Statement (DEIS) shows on a topographic base AIMM's proposed activity on the two claims and the inferred location of the Glory Hole deposit where it straddles the common sideline of claims #3 and #4 (Exhibit 2). Should at a later time claim boundaries be redrawn, any proposed activity then outside the boundaries of claims #3 and #4 would be eliminated or relocated for analysis within the redrawn boundaries.

The details and scope of AIMM's plan are defined in the proposed POO, other documents submitted by AIMM, and the Notice of Intent to Prepare an Environmental Impact Statement prepared by the Payette National Forest (Federal Register, 2002). AIMM summarized its view of the scope of the plan in response to a Forest suggestion to scale back the plan in order to facilitate the environmental analysis. AIMM wrote, "Our 1996 Operating Plan states the full scope of work we believe will be necessary to fully delineate the ore bodies on the claims." (Ivy, 2002).

This report examines AIMM's proposed uses of the surface that are likely to cause significant disturbance to surface resources and whether those uses are reasonably incident to mining. In this case, activities that are reasonably incident are determined by what is reasonable and customary for work on a mineral deposit whose known or inferred

extent is defined in the IBLA decision and other relevant documents. Included are comments relative to activities described in AIMM's POO and subsequent related submittals in light of Forest Service surface management responsibilities to minimize, where feasible, adverse environmental impacts to National Forest surface resources (36 CFR §228.8). The analysis is conducted under the assumption that all proposed activities other than the principal access route are on claims #3 and #4, two of the three claims with valid existing rights.

AIMM's proposed POO is organized under fifteen headings (Exhibit 1). Analysis and comments on selected plan elements follow.

-1. LOCATION AND ACCESS

Plan

AIMM plans to rehabilitate the Smith Creek road from it junction with Forest Service Road 371 to Forest Service designated Trail 013 and thence along the trail to the wilderness boundary at Pueblo Summit. From there, AIMM proposes to improve the 2.7-mile trail segment within the wilderness as far as the project area. On the #3 and #4 claims, AIMM would rehabilitate old mine roads and construct some new spur roads (Exhibits 1 and 2). All rehabilitation and construction would be geared to accommodate the equipment and activities AIMM lists in its plan.

Analysis

Access to the project area is necessary because without access, drilling, one of the next logical exploratory steps to evaluate the deposit cannot take place. Impacts associated with proposed road access, rehabilitation, and construction and the degree to which they may be reasonably incidental to mining are not entirely possible to determine because AIMM has not specified the type of drill rig to be used, though they indicate that "The drill rig sizes we indicated in our Plan are compatible with the original road width" (Ivy, 2002). There is, however, much variability in weight, wheelbase, turning radius, and height among truck-mounted drill rigs (one of the possible types of rigs proposed by AIMM) and each may have notably differing road requirements. Conversely, many track-mounted, skid, or buggy rigs may be entirely compatible with existing road parameters.

AIMM writes, "We do not believe the activity proposed in the 1996 Operating Plan will cause significant increases in surface disturbance" (Ivy, 2002). That belief is based largely on the historical mining disturbance at the site and the fact that "Large portions of the undisturbed areas of the claims are talus slopes of broken rock with little vegetation." (Ivy, 2002). AIMM's characterization errs in two respects. It does not take into account that much of the historical mine disturbance has over the last 70-100 years been largely obscured, and in some cases obliterated, by erosion and natural revegtation. Some of these naturally reclaimed areas would have to be stripped and then reclaimed and revegetated. Further, AIMM mischaracterizes the extent of talus slopes. Forest Service

specialists in soils and geology feel that very little of the undisturbed portion of the claims can be characterized as "talus slopes" (Egnew, 2003). Though talus slopes may not be covered with vegetation, reclamation and recontouring would still be required. Consequently, even in areas of historical disturbance and on rocky talus slopes, significant disturbance to surface resources resulting from proposed access would be unavoidable.

Though rehabilitating existing roads and new drill road construction may be necessary, it should be keyed to drilling when drilling is reasonably incident to mining. Drilling, as discussed under *Drilling Analysis* and in **Findings and Recommendations**, should be sequenced and roadwork necessary to access the drill sites should also be sequenced to reduce unnecessary impacts. Additionally, where alternatives exist in equipment suitable for drilling, equipment needing the least impacting means of access should be chosen.

-3. BUILDINGS AND CAMP

Plan

AIMM proposes, "Crews will be housed in the existing bunkhouse/cookhouse." and that "requirements will be adequately taken care of to preserve the living quarters, powder magazines, and other buildings associated with the Golden Hand claims in an upright and usable condition." ((Lombardi, 2000; Ross, 1996). AIMM later added, "The use of the bunkhouse is important for our intended operations in order to keep our crews relatively comfortable, well fed, and working onsite" and "Occupancy of the bunkhouse by our crews greatly improves the efficiency of our operation …" (Ivy, 2002).

Analysis

It is uncertain whether the bunkhouse is on claim #2 or claim #5. The 1996 POO shows it on claim #5, while the base maps for the Forest's DEIS show that it would be on claim #2 (Exhibits 1 and 2). Of the claims in the Golden Hand group, however, only claims #3, #4, and #8 have "valid existing rights". There should be no consideration of use or occupancy related to mining on any claim that has not established such rights.

If the bunkhouse were on claim #3 or #4, occupancy would not be warranted within the scope of AIMM's plan. Claims #3 and #4 are within reasonable commuting distance from the Logan Creek/Edwardsberg area where AIMM maintains fee lands containing facilities used by the company in the past to house mining-related personal. The distance from those facilities to the Golden Hand claims is estimated to be about 15 road miles, or little more than a one-hour drive, after the Smith Creek road and Trail 013 are marginally improved. In the context of local custom and culture regarding other backcountry jobs in resource-based industries, the work site is within a drive distance reasonable and customary for such jobs. There would be no need to make an exception for AIMM.

Though AIMM proposes to improve the condition of the bunkhouse in order to house personal, none of AIMM's reasons are compelling enough to justify such use. The belief

that occupancy "greatly improves the efficiency of our operation" and "that use of the bunkhouse is important for our intended operations in order to keep our crews relatively comfortable, well fed, and working onsite" (Ivy, 2002) is insufficient to warrant occupancy. As noted previously, people working in Idaho's backcountry customarily work safely, efficiently, relatively comfortably, are well fed, and have no problem reaching job sites and remaining onsite by commuting a reasonable and customary distance from their living quarters.

The use and improvement of the bunkhouse would be a convenience not necessary to the health, safety, or well being of the workforce. Others working in the backcountry in timber or other endeavors plan, live, and work with the uncertainties inherent in such work during a short field season.

AIMM's plan relative to use and improvement of the bunkhouse suggests that they may view the structure as "theirs". Such is not the case, however. The bunkhouse is a surface resource subject to use under an approved plan of operations if it is reasonably incident to mining and on a mining claim with valid existing rights. It is not reasonably incident to mining within the scope of AIMM's proposed POO.

-4. DEVELOPMENT OF ORE BODIES

Plan

AIMM proposes activity on three levels: trenching, drilling, and clearing underground workings. Spur roads are proposed in the area of the Glory Hole that will "facilitate development trenches and drilling". (Ross, 1996). Ross' "production trenching and drilling array" (locations) are shown on a map and the orientation and extent of the excavations are shown in table form (Exhibit 1). AIMM's proposed activity is also shown on the larger scale claim maps in the Alternatives described in the Forest's DEIS.

Forty-eight "production" drill holes are proposed on thirty-one drill sites. A vertical hole 500 feet deep would be drilled on each site. Additional drill holes, each 500 feet deep and inclined 30 degrees on a N 20° E bearing, would be drilled from seventeen of the sites. A total of about 24,000 lineal feet of drilling is proposed. Individual drill holes are not identified as to core or rotary.

Five "production trenches" are proposed at five locations. Trench lengths vary from 100 to 200 feet and vary in orientation. Each is planned to be five feet deep and five feet wide. The cumulative length of the trenches is about 750 feet. AIM writes that, "We need trench exposures to gain a more complete continuous exposure of the in-place rocks on the surface, which provides a number of benefits. The trench exposure provides a better understanding of the composition of the rocks, better sampling surfaces and allows for bulk samples of ore to be taken for metallurgical testing." (Ivy, 2002).

Trenches would remove from about 93 in-place cubic yards from the smallest trench (100 feet long) to about 185 in-place cubic yards from the longest (200 feet). Swell factors

can vary considerable between different rock types but applying a reasonable 30% swell factor would result in volumes ranging from about 121 loose cubic yards to about 240 loose cubic yards. To visualize this quantity, if entirely removed, the loose rock material from all five trenches would fill AIMM's 14-cubic yard tandem-axle truck about 54 times. AIMM has estimated "a maximum of 140 cubic yards of ore would be removed" (Ivy, 2002b).

Some underground work is also proposed but AIMM has provided little detail on their plans for underground activity other than in their original plan where AIMM writes, "Production development work would also be conducted underground from various adits. This work would consist of cleaning out of adits, drilling and possibly ore extraction." (Ross, 1996). Presumably, much of the work would focus on two levels, the Glory Hole Adit level and the level immediately below accessible from the "lower adit".

AIMM's original plan indicates that "Extracted ore would be hauled out to Logan Ck. for bulk testing." (Ross, 1996). Later clarification of language in the plan indicates that milling/processing is proposed to be off-site and outside the wilderness as noted by Ivy (2002) who wrote, ".... the Logan Creek Mill will be used only for the testing of bulk samples." Processing of ore, should actual mining later occur under a production mining and processing plan, may be at the Werdenhoff Mill site (Ivy, 2002).

General Analysis

AIMM has clarified that "... the 1996 Operating Plan never has included the extraction and processing of ore on a production basis." (Ivy, 2002). The plan is intended to collect the information necessary "...to the preparation of a production mining and processing plan." (Ivy, 2002). That plan would be developed and submitted at a later date. This is understandable since the Glory Hole indicated and inferred reserves have been identified without the benefit of significant underground data.

AIMM's POO and subsequent clarifications seem puzzling in two respects: the duration of the project and the pattern of drilling. The former is discussed briefly here and the latter discussed later under the drilling analysis.

AIMM writes that the plan could take 10 years to complete because of a 4-month work season wherein drilling would be conducted 60 days or less each operating season (Ivy (2002, Ivy 2002b). A 10-year project life, which would result in only about 4 holes drilled per season, might seem inconsistent with the goals one would expect of a mining company intent on optimizing data collection necessary to make a mine/no mine decision within a reasonable investment decision time frame. This seems particularly true since AIMM's 1988 economic analysis, prepared by Larry Mashburn, shows that the mine life could be as short as 29 days if other reserves are not verified (Mashburn, 1988). Given that the nominal price of gold has actually declined since the 1983-88 time frame and remains well below the price that existed in 1988, AIMM's unspoken goal may be to delay a decision as long as gold prices are inadequate to justify development.

Delaying a decision on mining might be prudent because indexing Mashburn's 1988 mining costs to 2001 for each of his three low-grade Glory Hole mining scenarios shows that none could be mined profitably at 2001 gold prices or at the current price. His 1988 mining costs, indexed for the intervening years using Western Mine Engineering, Inc. (WME) cost indexes for surface mine capital costs and operating costs, shows that break even gold prices in 2001 were $459.89 (for Low Grade A), $397.18 (for Low Grade B), and $416.75 (for Low Grade C) (WME, 2002). That compares with $271.04, the average price of gold in 2001, the most recent period for which full year WME indexes are available. The WME indexes are specific to component costs in the type of open pit mine model proposed by Mashburn. The break-even prices shown are likely on the low side as they are based on indexes more than a year old and they do not take into account any cost categories not included in Mashburn's analysis or that may have arisen since 1988.

Drilling Analysis-General Comments

In conventional mineral exploration, once a mineralized body is found and surface mapping, sampling, and remote sensing techniques reveal a potentially economic deposit, an initial drilling program is designed that is normally keyed to a genetic geologic model for the deposit. Drill hole locations and spacing are determined from the model. As drilling progresses, the model is refined or changed as necessary. Decisions on in-fill drilling, step-out drilling, and actual locations and spacing of holes are based on the evolving model and results from the sequential drilling as they are available. Ultimately, analysis all of the geological, geochemical, and geophysical data derived from the surface and drill results allow the mining company to a make a mine/no mine decision.

A drilling plan carefully designed based on geologic maps and cross sections drawn from detailed analysis of surface mapping and sampling is generally the most efficient and least impacting method to gain subsurface information on a mineral deposit. Should results warrant, drill programs evolve from widely spaced exploration holes designed to test for the presence and grade of mineralization to more closely and regularly spaced hole patterns, often on a grid. A more closely spaced pattern is designed to provide three-dimensional data necessary to delineate reliably actual mineral reserve blocks that can be classified as "measured" or "proven" rather than "indicated" or more speculative "inferred" reserves (reserves are discussed in more detail later under **ORE RESERVE ANALYSIS**). This information is critical to gain financial backing for the mine and to design an actual operating, rather than conceptual, mine plan.

Drilling Analysis-Plan of Operations

The Glory Hole mineral reserve framework has evolved somewhat differently from what would be expected under a conventional exploration project. Prior to drilling and based largely on sampling data mostly from two dimensions in surface and underground workings, the deposit has been accepted as having a reasonable prospect of being economic. With only limited data, it is reasonable to expect that AIMM's plan would be focus on verifying the depth and extent of preliminary reserves and verifying and

upgrading their status. Indeed, AIM has stated that "Our 1996 Operating Plan states the full scope of work we believe necessary to fully delineate the ore bodies on the claims." (Ivy, 2002) and that the plan will generate the information necessary "to the preparation of a production mining and processing plan." (Ivy, 2002). Yet, AIMM proposes to drill only two holes from a single site within the area of "known" indicated/ inferred reserves and the remaining 47 drill holes outside that body in a pattern reminiscent, at least partly, of a random "wildcat" effort.

Based on the overall layout, much of AIMM's proposed program is more akin to a random exploration plan than a development plan. The hole pattern is irregularly laid out along existing and proposed roads rather than forming a systematic pattern that would further define the "known" deposit to the degree needed to make a mine/no mine decision. Further, many of the sites are well outside the geologic structure that AIMM's consulting geologist Patrick O'Hara has identified as hosting the deposit.

Though AIMM feels that their drilling program will contribute fully to delineating the ore bodies, that is highly unlikely since only one drill site is proposed within the area inferred to be mineralized. Whether or not holes drilled from that one site confirm ore-grade mineralization at depth, other holes would be necessary to test the mineralized area and, eventually, define actual mine blocks. This is particularly important given the very low grade of the inferred gold mineralization and the difficulties of reliably defining very low-grade blocks of ore.

AIMM's proposal to drill other holes nearly 700 feet away from the Glory Hole and outside the geologic structure cannot be construed as anything other than rank exploration until drilling at intervening sites demonstrates the continuity of the deposit. Consequently, prudence and sound exploration practices dictate that all drilling be conducted in a logical sequence beginning in the indicated-inferred reserve block to verify reserves and proceeding outward to track extensions of the deposit, if any.

Trenching Analysis

There is a puzzling aspect of the trenching proposal. Assuming that O'Hara's northerly-trending structure is roughly as wide as the inferred Glory Hole deposit, then all proposed trench locations appear well beyond the limits of the indicated and inferred reserves and outside that geologic structure. They are in areas where mineral values are completely unknown (Exhibit 2). That raises several questions concerning whether proposing trenches at those sites is premature.

Though AIMM is correct in describing the benefits of a trench, the need, location, and timing of trenches intended to further delineate mineralization and provide bulk samples must be driven by information that shows such trenches are a logical and necessary step to develop the deposit. Work to date does not show this. Though surface mapping and sampling may indicate mineralization, it is not until that mineralization is shown to extend to depth that a trench would be justified. Surface sample results alone are not adequate and may be misleading.

AIMM principal Conway Ivy agreed that bulk samples will not be necessary until a mine plan is prepared and submitted. In response to a comment by Jack Walker, another AIMM principal, that "about a truckload' of samples would be needed, he said, "Pat is our expiration (sic) geologist and as such they (sic) deal with smaller sampling but as we would get to the point of doing a mine plan and a mine process plan – that would require larger bulk sampling." (Ivy, 2002c, p-5). Those samples would be expected to come largely from trenches.

Trenching will only test the upper five feet of surface material and would be unlikely to contribute significantly to the evaluation of the deposit until the deposit's inferred subsurface and lateral extent can be first verified. It is unlikely that simply excavating trenches in unconsolidated surficial material (colluvium, weathered rock, and possible glacial debris) will provide the quality exposures necessary to obtain a fresh sample of mineralized rock, if present, from which a valid bulk sample can be obtained.

Equally uncertain is whether samples from surface trenches will be representative of all, or any significant portion of, the deposit even if trenches are sited on mineralized ground. Before that can be answered, subsurface data will have to define the metallurgical character of the deposit and to what extent it may be oxidized. The depth of oxidation is a key piece of data needed prior to any decision on trench locations.

Trenching will be the largest single impact to surface resources that AIMM has proposed. Where road-related construction or renewal can be simplified using existing roads and using low impact drilling equipment, trenches would be significantly more impacting to soils, vegetation, and slopes. Trenching using a bull dozer, track hoe, or back hoe would excavate and side cast large amounts of soil, rock, and vegetation on steeps slopes with the attendant later difficulties in retrieving waste to backfill the trenches. Added to the potential impacts is the question of whether explosives will be needed during excavation.

Difficulties in siting trenches based only on surface data introduces uncertainties as to whether the trenches are sited at the optimum location and optimum orientation. In view of AIMM's stated goal of minimizing adverse environmental impacts, prudence and economics dictate that trenches should only be dug after drilling demonstrates a need and points to the best locations. If drilling does not confirm the existence of valuable mineralization in the vicinity of the proposed trenches then use of the surface for trenching in those areas is not reasonably incident to mining.

Underground Analysis

The amount of waste to be generated by clearing underground workings in preparation for sampling is not known. Presumably, it would be relatively small and its disposal on existing historical waste dumps would have little affect unless the amount grew to be substantial. In that case, alternative sites might be shown to be less impacting to surface resources. Were AIMM to propose a substantial underground development program, it would not be reasonably incident to mining until drill results confirmed significant

mineralization at depth. As proposed, the modest program AIMM has outlined in their plan would be reasonably incident to mining.

Milling Analysis

Milling and associated transportation issues should not arise for a year or two or until drilling verifies the presence and extent of ore in the areas proposed for trenching. Proposed trench sites are located well beyond the limits of indicated/inferred reserves as defined by the IBLA. Whether those reserves exist and whether there are extensions of the ore body where trenches are proposed has yet to be fully determined.

-5. *EQUIPMENT*

Plan

AIMM's original plan provided a general list of equipment (Ross, 1996). Subsequently, a more detailed list of actual equipment and use was supplied (Lombardi, 2000). A key piece of equipment, the drill rigs, "... will consist of smaller truck or track mounted core or reverse circulation types." (Ross, 1996). Later, use of one rig was specified but the exact type was not (Lombardi, 2000).

Analysis

The equipment list tabulates an array of equipment reasonably incident to mining and applicable to the next step in evaluating the Glory Hole deposit under a plan such as proposed by AIMM. Without knowing the specific drilling equipment, it is not possible to completely evaluate the impacts to the existing and proposed road network. With the possible exception of the "tandem drive flatbed truck" (low-boy?), the equipment could probably reach the project area, but with varying degrees of impacts associated with the road. The equipment list is not entirely inclusive but the list is reasonable for the scale of operations proposed. Use of the 14-yard tandem-axle truck is not expected until drilling confirms that trenching is reasonably incident to mining.

-6. *TRANSPORTATION*

Plan

Once the project has been mobilized each season and the major pieces of equipment reach the claims, daily transportation in and out of the wilderness should be minimal. Under AIMM's proposal, the principal activity should be confined to pickups transporting crews and supplies.

The plan also calls for "a few (less than ten)" trips necessary to transport samples for metallurgical testing using a 10-ton truck or a 14-yard tandem-axle truck (Ivy, 2002; Lombardi, 2000).

Analysis

The expected traffic necessary to mobilize and support daily operations is reasonable and customary for a project such as AIMM has proposed. Use of the 14-yard tandem axle truck for moving bulk samples is not anticipated and would not be reasonably incident to mining until drilling verifies the presence and extent of ore in the areas proposed for trenching.

If the deposit is verified, the use of the ore truck may be greater than what is proposed in the plan (i.e., greater than 10 trips) over the 10-year life of the project. Given that drilling should precede trenching, and that no trenching should occur before positive drilling results point to optimum sites and impacts associated with those sites are analyzed, then no bulk samples would be expected for the first season or two, and may never be warranted.

-8. EXPLOSIVES

Plan

The plan mentions use of explosives but provides no detail on use. AIMM's original plan indicates that explosives "will be properly stored in the powder house until taken to their place of use." ..... ", and, "requirements will be adequately taken care of to preserve the living quarters, powder magazines, and other buildings associated with the Golden Hand claims in an upright and usable condition" (Ross, 1996). Presumed applications may relate to road construction, underground work, and trenching.

Analysis

Explosives would be rarely used, as the scope of the project does not appear to require significant blasting. Depending on the type of drill rig access, road construction parameters could vary substantially. Generally speaking, however, neither AIMM's POO or other alternative rig access would require significant blasting unless there was no alternative. Road routes, however, have yet to be exactly determined and so may be able to be placed where the need for blasting is negligible. In the type of trenching envisioned in the plan, blasting would not likely be necessary. Similarly, as adits are cleaned out for sampling, blasting is unlikely. With so little use of blasting envisioned, storage of explosives on-site should not be necessary.

ORE RESERVE ANALYSIS

To understand what uses of the surface are reasonably incident to fully delineating the Glory Hole deposit requires a reasonable understanding of the quality and quantity of information available on the Glory Hole reserves. In deciding the validity of claims #3 and #4, IBLA performed no independent analysis that could have reconciled important contradictions regarding the reserves and economic analysis. Further, the Board did not have the benefit of a separate independent analysis of the reserves on the property nor the benefit of a discussion of the relationship between cutoff grades and mineral reserves. Consequently, it is appropriate to briefly examine pertinent aspects of the Glory Hole reserves.

It is important to first note that the terms "measured reserves", "indicated reserves", and "inferred reserves" have been commonly used throughout this case. The three terms incorporate decreasing qualitative and quantitative data on which each reserve category is based. Of the terms, the most important to understand is "inferred reserves" as it is used to characterize the largest quantity of mineralized rock during testimony on the Glory Hole deposit. It is that category of reserves that AIMM hopes to verify and even expand. AIMM geologist William Vanderwall defined the term as presented by the USGS and Bureau of Mines (Anon., 1980; Transcript, 1988, p-597):

> "Inferred reserves or resources for which quantitative estimates are based largely on broad knowledge of the geological character of the deposit and for which there are few if any samples or measurements. The estimates are based on an assumed continuity or repetition of which there is geologic evidence; this evidence may include comparison with deposits of a similar type. Bodies that are completely concealed may be included if there is specific geologic evidence for their presence. Estimates of inferred reserves or resources should include a statement of specific limits within which the inferred material may lie."

It is readily apparent from the definition that the term incorporates substantial uncertainty as to the quality and quantity of information on mineral reserves classified as "inferred" because that classification is based mostly on inference rather than specific measurements and samples taken directly from the body itself. The "*Guide for Reporting Exploration Information, Mineral Resources, and Mineral Reserves*", widely adopted in domestic and international mining and financial communities, has gone so far as to eliminate the term "inferred reserves" because of difficulties in developing a meaningful definition (SME, 1999).

U.S. v. American Independence Mines and Minerals, 122 IBLA 177 (1992)

The Board wrote in its decision that AIMM geologist William Vanderwall calculated indicated reserves for claims #3 and #4 from an area 210 feet long, 105 feet wide, and 30 feet thick (Exhibit 3). The Board wrote, "So computed, 39,360 tons of indicated reserves and 280,770 tons of inferred reserves were calculated for these claims (Tr. 533, 545)."

The Board erred in interpreting Vanderwall's calculations. It mistakenly included his 39,360 tons of indicated reserves in the 280,770-ton figure that the Board characterized as "inferred". The diagrams that are the basis for Vanderwall's computations clearly show that indicated reserves only are within the 210-foot by 105 foot by 30-foot body and that 280,770 tons is the sum of his indicated and inferred reserves (Exhibits 3 and 4). Vanderwall's inferred reserves actually lie outside the area of indicated reserves.

Vanderwall's total tonnage in the deposit (indicated plus inferred reserves) is properly calculated from his diagram that shows a body 250 feet long, 210 feet wide, and 70 feet thick bounded by the two igneous dikes delineated by O'Hara (Exhibit 4). His inferred reserves are correctly calculated by subtracting indicated reserves from the total tonnage. So calculated, Vanderwall's inferred reserves are actually 241,080 tons (294,000 total reserves minus 52,920 tons of original indicated reserves). Vanderwall eliminated as "void space" 13,230 tons (about 25%) from the original 52,920 tons of indicated reserves leaving 39,690 tons. "Void space", as defined by Vanderwall, included areas mined out and tonnage missing due to erosion.

The Board wrote that AIMM's consultant Larry Mashburn used in his economic analysis tonnage figures furnished to him by Vanderwall but, "though derived from tonnage figures calculated by Vanderwall, were analyzed somewhat differently." The Board went on to concentrate on Low Grade C, one of three low-grade mining scenarios described in Mashburn's report and testimony. Mashburn's other mine scenarios are Low Grade A based on 14,400 tons of "demonstrated ore" that he apparently calculated separately from Vanderwall's indicated and inferred reserves and Low Grade B based on 48,000 tons of ore (not defined by reserve category) also computed differently but from the same area as Vanderwall's 39,690 tons of indicated reserves. If Mashburn had calculated Low Grade B reserves consistent with the way he calculated Low Grade A reserves, the actual tonnage should be 48,120.

Mashburn's methodology for Low Grade C used 289,200 "total inferred reserves" rather than Vanderwall's 280,770 tons of combined remaining indicated and inferred reserves (IBLA, 1992; Mashburn, 1988). Mashburn's figure is derived from Vanderwall's combined original indicated and inferred reserves of 294,000 tons minus 4,800 tons (rather than Vanderwall's 13,230 tons of "void space") that Mashburn estimated had already been mined. Mashburn apparently did not subtract anything for that part of the deposit that had been lost to erosion. The Board went on to write, "Using actual cost items, Mashburn estimated that reserves provided by Vanderwall would support a four-year long open pit operation that would remove 289,200 tons of ore.."

Mashburn's reserve and economic analysis is clouded by contradictions between his hearing testimony, his written report, and the absence of any discussion of cutoff grades. Though his written economic analysis of Low Grade C is apparently based on reserves calculated from a 70-foot thick deposit, the dimension he shows that was actually used is 20 feet (Mashburn, 1988, p. C-1). When asked during testimony as a point of clarification the dimensions of the pit needing reclamation, Mashburn referred to the 20-

foot thick (or deep) dimension (Transcript, 1988, p. 647). Consequently, he either twice erred in presenting the 20-foot dimension or he intended to change to a 20-foot thick deposit but did not follow through with the calculations.

Mashburn actually may have intended to change the thickness from 70 feet to 20 feet to calculate Low Grade C reserves because, as the Board noted, he applied his own judgment to Vanderwall's figures and analyzed them "somewhat differently". For example, he apparently miscalculated Low Grade B reserves and changed Vanderwall's tonnage figures and classification on Low Grade C to reflect his personal judgment of "total inferred reserves" rather than Vanderwall's correctly designated "indicated" and "inferred" reserves. By classifying all of the Low Grade C reserves as "total inferred reserves" he eliminated the more certain "indicated reserves" of Vanderwall and threw all of those reserves into the least certain category of "inferred". Presumably, Mashburn understood the importance of correctly classified reserves and so it is unlikely that he would have done so unless his professional opinion of the reserves differed from Vanderwall's.

To further confuse the reserve picture, Mashburn made that change after completing his Low Grade A analysis based on 14,400 tons of "demonstrated ore" a term he used in his report but that is not found in the technical literature on the subject of reserves. "Demonstrated reserves", however, is an accepted term representing the sum of the "measured" and "indicated" categories. However, as noted by the Board, there are no measured reserves on any of the Golden Hand claims. Consequently, though Mashburn implied by use of the term "demonstrated" that a portion of the 14,400 tons is "measured", that is incorrect and the reserves must be properly classified as "indicated". As the Board noted, Mashburn departed from the dimensions Vanderwall used to estimate indicated reserves, and in doing so the departure was significant. Why he chose to break out a portion of Vanderwall's 39,690 tons of indicated reserves and mischaracterize them is conjectural as it does not appear to serve any purpose.

If Mashburn intended to compute Low Grade C reserves using a 20-foot thickness, the 289,200-ton "total inferred reserves" would be reduced by about 73% to about 79,200 tons, a significant difference. Though it would affect his economic analysis, it would not necessarily render the deposit uneconomic given that he had determined that a deposit as small as 14,400 tons was economic. In that instance, of course, he did so without considering the deposit's cutoff grade and its affect on that scenario as well as the Low Grade B and Low Grade C scenarios

U.S Bureau of Mines Report

IBLA did not have the benefit of a report by the U.S. Bureau of Mines that in 1990 independently analyzed the same data on the Golden Hand claim group that was discussed in the administrative hearing conducted in 1988 (Thompson and Boleneus, 1990). It was prepared for Idaho Senator James McClure, who considered the Bureau an objective party, and it clearly shows that the Bureau's authors had major reservations about the grade and quantity of inferred reserves on the claims and around the Glory Hole

in particular. Their language is instructive concerning the reliability of estimates on the indicated and inferred reserves.

Relative to the indicated reserves, the Bureau wrote,

> "The indicated reserves for the Glory Hole appear to be reasonable estimates based on the sample density, sample results and relationships to exposed or mapped geology."

With regard to the inferred reserves, however, the Bureau was skeptical. They wrote,

> "In the case of the Glory Hole, the tonnage estimate may be high. The length extension based on the geology is reasonable. However, increasing both the width and depth dimensions may not be reasonable, based on the existing geological and sampling data. This uncertainty can also be extended to maintaining the same grade for the increase tonnage because of the lack of sampling information."

The Bureau later added with regard to the economic analysis and the inferred reserve estimates of the Golden Hand properties,

> "The remainder of the costing study concerning the inferred reserves are (sic) shown to produce positive cash flows at the estimated grades and recoveries. The critical point here appears to be the grade continuities. Again, there is little sampling or geological evidence for the continuity of inferred grades at indicated reserves grade projections."

And finally in their summary conclusions the Bureau wrote of the inferred reserves,

> "There is some question concerning the grade projections for the inferred reserves as the grades do not appear to be supported by sampling data for the expanded tonnage areas".

Mineral reserves and cutoff grades

In reaching their conclusions, the Bureau of Mines certainly considered the assay data. Though not discussed specifically, the Bureau was well aware that one of the most critical elements to be established when estimating reserves is the cutoff grade. Two of the definitions of cutoff grade accepted by the Bureau are, "In ore estimation, the lowest grade that will meet costs", and "Term sometimes used to define the assay grade below which an ore body cannot be profitably exploited" (Thrush, 1968). Clearly, material assaying less than the cutoff grade is waste rock.

Stone and Dunn (1998) concisely summarized the importance of the cutoff grade when they wrote:

"UNLESS ABSOLUTELY UNAVOIDABLE, ORE THAT WILL NOT PAY FOR ALL OF THE COSTS WITH WHICH IT WILL BE CHARGED SHOULD NEVER BE MINED OR SENT TO THE MILL." (emphasis in the original).

In reality, Stone and Dunn erred slightly when they made reference to "ore". Any "ore" that will not pay for itself is, by definition, not "ore". Their point, however, is clear.

The cutoff grade is clearly a vital piece of information that a mining company calculates beginning with the earliest preliminary reserve estimate and continuously thereafter through the last ton of ore mined. As data evolve through mine planning and mining operations, the cutoff grade may change. The cutoff grade can have an enormous impact on the economics of a deposit and no economic analysis is complete without it because it differentiates ore from waste. In surface mines such as proposed at the Golden Hand, it is critical when estimating the stripping ratio. In that regard, the absence of a cutoff grade in Mashburn's economic analysis is puzzling as is the conspicuous near-absence of a discussion of cutoff grades in the hearing transcript. When briefly quizzed as to what might constitute ore grade in a deposit similar to the Glory Hole, AIMM geologist O'Hara replied, "... in all probability, anything between .03 and .05 -- .03 being very marginal depending -- you need a lot of tonnage, .05 being more reasonable as ore grade ". (Transcript, 1988, p. 499). O'Hara's appears to be the only testimony in the transcript regarding cutoff grades.

Calculated from data in Mashburn (1988), cutoff grades at the Glory Hole deposit in 1988 were 0.043 opt Au for Low Grade A deposit, 0.037 opt Au for Low Grade B deposit, and 0.039 opt Au for Low Grade C deposit. At those respective grades, costs would have equaled income and only assays above those thresholds would define for each scenario actual reserves. Properly indexed over the intervening years, those cutoff grades would rise significantly.

Exhibit 5 shows that only 26 (43%) of 61 samples relied on by AIMM to compute reserves are above the lowest 1988 cutoff threshold of 0.037 opt. Many tend to cluster in a relatively narrow area around the entry to the Glory Hole Adit and around the pillar between the two adit entries, one blocked and the other open when sampling was done in the mid-late 1980's (Exhibit 6). The remaining 35 (57%) are below cutoff.

Though it would not be unusual to see assays below cutoff grade from a body as little explored as the Glory Hole deposit, the expectation would be that those samples would be scattered through the ore grade assays (i.e., those greater than 0.037 opt). That follows from the fact that the entire 289,200 tons of AIMM's indicated and inferred reserves has been accepted as ore. Based on available information, however, that is not the case. The assays actually show that in 1988 a very large part of the body thought to contain indicated or inferred reserves was actually below cutoff grade and was uneconomic waste. Exhibit 6 shows that in the indicated category alone, as much as 65% or more of the "reserves" actually may fall below the 0.037 opt cutoff.

The inevitable conclusion is that a large portion of the Glory Hole reserves accepted by IBLA may not have been "ore" grade after all. Only a carefully designed exploration plan will answer that question.

Reserves – Summary Comments

Inferred reserves by their very nature are the least reliable category of mineral reserves. The reliability of any estimate of inferred reserves, or even indicated reserves, is greatly dependent upon further delineation by measurement and sampling. Reliability of both indicated and inferred reserve estimates at the Glory Hole is clouded by a litany of factors: contradictory testimony before IBLA; AIMM's ambiguous reserve figures and reserve classification; the Bureau of Mines skeptical analysis; and the absence of any cutoff grade used in AIMM's reserve and economic calculations. Further exacerbating the problem is that AIMM's reserve estimates were apparently assembled from geologic maps and cross-sections described as "sketch", "reconnaissance", and "highly schematic", terms usually applied to early exploration stage preliminary work products. Taken together, these several factors create considerable uncertainty as to the amount of reserves actually on the property and how, if they exist, they should be properly classified.

Though the basis for the reserve figures and economic analysis accepted by IBLA is clearly contradictory and the classification of reserves murky, the intent here is not to question the Board's decision but to exercise caution when using critical data to determine what use of the surface is reasonably incident to mining. If the data are flawed then the Glory Hole deposit may contain far fewer reserves than AIMM thinks, or the deposit may not exist at all. Based on current information, it is unlikely to contain more reserves but that possibility cannot yet be completely ruled out.

Questions on the amount of reserves and the classification of reserves are not inconsequential. Mashburn's three Glory Hole mining scenarios and attendant economic analyses show that, if existing reserves are verified but no additional reserves are defined, mine life may be as short as 29 days (based on 14,400 tons), 100 days (based on 48,000 tons), or 4 years (based on 289,200 tons). If estimates of reserves are not verified, there would be no mine and if more reserves are found mine life could be greater than four years. Against this backdrop of considerable uncertainty regarding reserves and mine life, it is prudent for the Forest Service to approach with caution the question of what use of the surface is reasonably incident to mining within a designated wilderness area.

DISCUSSION

Prior to drawing any conclusions regarding AIMM's proposed plan of operations, it is important to briefly discuss two important points: (1) economic viability on mining claims deemed to be valid by virtue of having a discovery of a valuable mineral deposit; and, (2) conducting mining operations along a logical and sequential path.

Mining claim validity does not guarantee a successful mining venture

In determining that AIMM enjoys valid existing rights on claims #3 and #4, IBLA did not say that the deposit could be mined profitably. The Board simply said that claim #3 and #4 had a discovery of a valuable mineral deposit as of the date of the hearing and the date the wilderness closed to mineral entry. Though the definition of "discovery" does not appear in the General Mining Law, as amended (30 USC 22), the definition long accepted stems from *Castle v. Womble*, 19 LD 455 (1894), confirmed later in *Chrisman v. Miller*, 197 US 313 (1905):

> "… where minerals have been found and the evidence is of such a character that a person of ordinary prudence would be justified in the further expenditure of his labor and means , with a reasonable prospect of success, in developing a valuable mine, the requirements of the statute have been met."

There is no guarantee of economic viability in a successful test of "discovery" only a "reasonable prospect of success". Consequently, though claims #3 and #4 are "valid", whether development of the Glory Hole deposit eventually proves to be an economic venture remains to be seen. Certainly, no prudent mining company would open a mine based solely on "total inferred reserves", as shown in Mashburn's economic analysis, and no reputable financial institution would loan development money on such information. AIMM fully understands this because they have not proposed actual mine development, choosing instead the prudent course of expending their labor and means to further define the ore they believe is present.

AIMM mischaracterizes the Board's decision regarding the possible economic viability of the deposit when it writes that the reserves were "confirmed by American Independence at the validity contest", and that the reserves "were sufficient to support the conclusion that a profitable mine could be developed on the claims." (Ivy, 2002a). As noted in the previous paragraph, the successful test of validity carries no such certainty of economic viability. Further, AIMM misspeaks when it contends that the reserves were "confirmed". The Board simply "confirmed" that it accepted that the reserves could be characterized as "indicated and inferred". In doing so, it also accept the substantial uncertainties attendant on those categories of reserves. As AIMM itself verified, "the calculation of reserves at the hearing was preliminary in that it was made without the drilling and trenching that is necessary to fully delineate the ore body." (Ivy, 2002a) As any credible exploration geologist will attest, inferred reserves calculated mostly on two-dimensional data are loaded with uncertainty.

Sequencing mining activity – General comments

A mine cannot be developed before minerals have been found and an ore body cannot be mined before it is verified to exist. Though intuitively obvious, this simple principle establishes the logical sequence that guides any responsible effort to mine. If basic prospecting discovers valuable minerals and additional exploration defines a potential ore body then further development efforts to define, characterize, and evaluate the mineral deposit may lead to a decision to actually open a mine. This sequence results in increasing levels of data acquisition and activity on the land. As data evolve, there is an attendant increasing level of economic certainty (or lack thereof) regarding the economic viability of the deposit.

Whether intentional or not, AIMM succinctly summarized in their plan for the Glory Hole deposit the correct sequential steps leading thorough the early stages of exploration on any mineral deposit (Ivy, 2002a):

> "1) prepare more detailed geological mapping; 2) conduct additional, non-surface disturbing surface soil and lithogeochemistry sampling; 3) conduct non-surface disturbing geophysical traverses; 4) drill boreholes to determine the spatial position of the deposit in three dimensions; and 5) trench to obtain bulk samples for metallurgical testing."

Should results of these prove favorable, other steps would naturally follow as the quality and quantity of data grew. If results are unfavorable, it is unlikely that the project would be pursued.

The logic of sequencing is obvious to a mining company and to a potential financial backer: Minimize the commitment of economic resources until, at each level, there is increasing confidence adequate to justify moving to the next stage of development until, eventually, a mine is actually opened or the property is abandoned. The level of activity is always guided by the quality, quantity and reasonable interpretation of data as they evolve.

The logic of sequencing is also obvious to the Forest Service whose charge is the management of surface resources: Keep it small, to the extent practicable, and build, if warranted, from there. In other words, minimize the amount of disturbance to surface resources in order to prevent unnecessary destruction of the forests, and ensure to the extent feasible that disturbance is commensurate with each level of development.

That simple principle is of paramount interest to the Forest Service that, by its Organic Act, is responsible on lands in the National Forest System "to regulate their occupancy and use and to preserve the forest thereon from destruction." Equally important, the principle has been articulated by the 9th Circuit Court in *United States v. Richardson*, 599 F.2^{d} 290 (9th Cir. 1979), *cert denied.* The Court clearly articulated that mining is a sequential process composed of logical steps. Further, mining activity that would cause

significant surface disturbance on lands in the National Forest System must be related to a logical step in that process and the steps must be in the proper sequence.

Sequencing activity reasonably incident to mining at the Golden Hand

AIMM understands the value of properly sequencing its activity at the Golden Hand. Against a backdrop of subeconomic gold prices over the last few years, they have proposed a 10-year plan that they expect will generate the information they hope will lead to the next stage of development. Expressed in the plan or in subsequent communications, AIMM describes non-impacting geologic, geophysical, and geochemical studies as well as surface disturbing drilling and trenching. In the list of activities, those of most interest in terms of disturbance are drilling and trenching. An analysis of both appears in prior sections so the intent here is to simply examine AIMM's proposal in light of logical drill sequencing.

When seeking to verify or extend reserves through drilling, sequencing the work is time and space dependent. In that regard, in-fill verification drilling normally precedes step-out drilling designed to locate extensions of a proven deposit or discover new deposits. The prudent policy is to verify first and extend second. AIMM has proposed essentially none of the first, choosing instead to concentrate on step-out drilling.

Though AIMM appears to accept the principle of sequencing, their POO proposes only two drill holes from a single site within the area of "known" indicated/inferred reserves in the Glory Hole deposit. All other proposed drill sites are beyond the deposit's inferred perimeter as defined by the hydrothermally altered area between the two dikes described by AIMM's geologists. Though the record does not contain a suitably detailed map of the geologic structure, which O'Hara identified as containing the Glory Hole deposit, about 20 of the 31 drill sites also appear to be outside the limits of that structure. Consequently, without information that indicates mineralization in those areas, that would be viewed by most exploration geologists as pure "wildcat" exploration.

To be consistent with their stated goal of fully delineating the reserves, a more logical course of action would be to propose a minimum of 6-8 holes within the area of indicated/inferred reserves. Underground sampling would supplement the results of this drilling. Were the reserves to be verified, step-out drilling or other work may then be warranted. As AIMM well knows, drilling to verify reserves may fail to do so even though inferred reserves are hypothesized based on surface information. That speaks to the degree to which reserves, characterized as "inferred", is truly known.

In light of this geological and economic reality common to all mining ventures, the importance of Forest Service efforts to minimize adverse impacts to surface resources is underscored by AIMM's recognition that "It is important to note that information gathered as we progress may lead us to determine that we do not need to go forward with all the work described in the 1996 Operating Plan (Ivy, 2002). That translates to the understanding that as data evolve, it will lead to a decision to mine or not to mine. That decision, however, should be based on data derived from a carefully designed evaluation

plan geared first to verify reserves and second to explore for extensions of the deposit. Any plan that is not crafted toward these purposes is not reasonably incident to mining.

Knowing that the mineral reserves were calculated partly from surface and underground sampling that shows significant areas below cutoff grades and on inference drawn partly from that data and from other contradictory information, the Forest Service is justified in proceeding cautiously to evaluate proposed uses of the surface associated with efforts to fully delineate the deposit. This approach is consistent with AIMM's stated concerns to minimize costs and environmental impacts, and is consistent with the Forest Service's allied two concerns: ensure that use of the surface is reasonably incident to mining, and, minimize, where feasible, adverse environmental impacts associated with significant disturbance to surface resources. A cautious approach would not inhibit, endanger, or materially interfere with the mining process and would not prevent AIMM from collecting necessary information. It would simply ensure that the data were collected sequentially and deliberately from sites and using equipment least destructive of surface resources.

FINDINGS AND RECOMMENDATIONS

The Forest Service minimizes, where feasible, adverse impacts to National Forest surface resources by ensuring that use of the surface for mining activity is reasonably incident to mining. Adverse impacts that are not acceptable are those uses of the surface that cause significant disturbance that is not reasonably incident to mining.

AIMM's proposed POO incorporates uses of the surface that are generally reasonable and customary to exploring and developing mineral deposits during different stages of development. Not all uses, however, are necessarily reasonably incident to mining on claims #3 and #4 at the present time based on available information from AIMM, the IBLA decision, Forest files, and the approach one would expect from a prudent mining company. Uncertainties associated with the actual extent and quality of reserves make it important to approach the surface use analysis with caution regarding the level and timing of impacts to surface resources that are associated with the proposed plan.

In order to minimize impacts to surface resources, it is prudent economically for the operator and in the interest of protecting National Forest surface resources (including wilderness) to sequence activities rather than proceed with proposed activities simultaneously. Since AIMM has indicated work under the plan could last for 10 years, sequencing should not impose any great hardship, nor endanger or unreasonably interfere with the operator.

Pre-approval confirmation

It is important that the Forest Service verify that any authorized surface disturbance beyond the principal property access route is actually on claims #3 and #4. Confirmation of claim orientation, dimensions, and claim corners is an essential element that must be

completed prior to authorizing any use of the surface that will create significant disturbance to surface resources or wilderness values. That can be accomplished by AIMM cooperating to identify in the field the claim corners and completing the base map and proposed joint field orientation early next field season.

Activities reasonably incident to mining with current geological and reserve information

The use of the surface on claims #3 and #4 for drill sites, drill access, and access for ancillary support equipment is reasonably incident to mining when the drilling is logically sequenced. A prudent course of action would be two-fold:

-1. Drill at sites 11, 12, 13, 21, 22, and 23 and propose an additional 6-8 sites within the 250-foot long by 210-foot wide body of "known" indicated/inferred reserves around the Glory Hole. This array would test the interior and perimeter of the "known" deposit. Any sites not analyzed in the DEIS would need an environmental analysis. At all times, use drill rigs that will require minimal surface disturbance in order to reach recommended drill locations.

-2. If results from a combination of holes at 6-8 sites in the "known" deposit verify significant mineralization at ore grade, and other holes at drill sites 11, 12, 13, 21, 22, and 23 show significant geological intercepts, revamp the proposed POO drill array to site future drill holes at optimum locations to further upgrade the reserves and define the extent of the ore body. Any future sites not analyzed in the DEIS would need an environmental analysis.

The modest underground exploratory program AIMM has outlined in their plan is reasonably incident to mining and would create little impact to surface resources. Reopening and clearing the Glory Hole Adit will allow data collection valuable to formulating a more complete geological and reserve analysis.

Activities not reasonably incident to mining based on current geological and reserve information

Until the Glory Hole's indicated/inferred reserves are verified by in-fill drilling and supplemental sampling underground, the use of the surface at all drill sites other than 11, 12, 13, 21, 22, and 23 is not reasonably incident to mining. Such use of the surface at other sites would not be based on geological information that would reasonably support their need and justify the associated disturbance to surface resources.

Use of the surface for trenching is not reasonably incident to mining at this time. Trenching should be deferred until drilling verifies the deposit and confirms that the deposit extends to the surface and subsurface of the areas proposed for trenching. Positive drill results will lead to more accurately locating possible trench locations, establishing trench orientation, and minimizing disturbance to surface resources.

Only claims #3 and #4, and #8 have valid existing rights and can be occupied for purposes reasonably incident to mining. The bunkhouse, presumed to be on claim #2 or #5, cannot be considered for occupancy.

Under AIMM's POO, residential occupancy of any kind on claim #3 or #4 is not reasonably incident to mining. The work site is within a drive distance reasonable and customary for backcountry job sites in Valley County.

Confirming information

The Forest Service and AIMM share a common interest in ensuring that mining activity is conducted in a manner that minimizes adverse environmental impacts. AIMM's interest is properly driven by economic concerns while the Forest Service's interest is driven by it statutory and regulatory responsibilities to minimize, where feasible, adverse impacts to National Forest surface resources. Consequently, it is important that both parties collaborate to determine to what extent future surface disturbance is reasonably incident to mining based on results from a logical, sequential, prudent exploratory effort conducted under the provisions of an approved POO.

Both parties can pursue their individual and joint interests by cooperating constructively and sharing information as it is collected, whether it is environmental or derived from exploratory work under the POO. In this regard, through a negotiated process with AIMM, the Forest Service should confirm though independent analyses the results of AIMM's efforts to fully delineate the Glory Hole deposit. Collectively, the data will help guide AIMM and the Forest Service through the design and evaluation of any future proposed activity that is reasonably incident to mining.

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2002

EXHIBIT 1: AIMM 1996 Plan of Operations

KRASSEL RANGER DISTRICT
RECEIVED
APR 16 '96
CR______ FS/WLF______
FIRE______ WATERSHED/SOILS______
REC______ MIN______
ADM______

RICHARD L. ROSS

CONSULTING GEOLOGIST

April 14, 1996

Mr. Jim Egnew, Minerals Specialist
Krassel District, USFS
P.O. Box 1026
McCall, ID 83638

Dear Jim
Following is:

PLAN OF OPERATIONS
FOR
GOLDEN HAND #3 AND #4

page 1 of 4 1996 Golden Hand POA

1 - LOCATION AND ACCESS

These claims are located in T22N, R9E (unsurveyed), Boise Meridian, and comprises part of section 26. Access to the claims is via Forest Service (FS) Road No. 48 east from McCall for approximately 52 miles to FS 340 (four miles beyond Yellowpine); then north on 340 to Big Creek, about 18 miles. From Big Creek, continue along FS 371 for two miles to Smith Creek. Then continue up Smith Creek for four miles to the intersection with FS 373. Turn northeast on 373 towards the old Werdenhoff mine and continue for 3.6 miles to Pueblo Summit. Continue past the wilderness gate on Pueblo Summit along the old access road for about 2.7 miles to the Golden Hand mine.

2 - ROAD MAINTENANCE

for existing claim access roads, existing roads on claims, and on claim spur roads will consist of clearing the road of sluff, downed trees, and other impeding obstacles to maintaining a safe width for equipment transport..

3 - BUILDINGS AND CAMP

requirements will be adequately taken care of to preserve the living quarters, powder magazines, and other buildings associated with the Golden Hand claims in an upright and usable condition.

Doc # 200

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F00527

RICHARD L. ROSS

CONSULTING GEOLOGIST

KRASSEL RANGER DISTRICT
RECEIVED
APR 16 '96
DR______ FS/WLF______
FIRE______ WATERSHED/ SOILS______
REC______ MIN______
ADM______

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Doc # 250

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4 - DEVELOPMENT OF ORE BODIES

will consist of several spur roads in the area of the Glory Hole. These road spurs will facilitate development trenches and drilling, which will be conducted to further develop the Glory Hole ore body. The production trenching and drilling array are presented on the map in Attachment 1. The specifications for these operations are available in the table in Attachment 2. Production development work would also be conducted underground from various adits. This work would consist of cleaning out of adits, drilling and possibly ore extraction. Extracted ore would be hauled out to Logan Ck. for bulk testing.

5 - EQUIPMENT

utilized for this project will consist of the following; backhoe/loader, bulldozer of Cat D7 horsepower or less, road grader, compressor, saws, underground mining machinery, generator and hand tools. Drill rigs will consist of smaller truck or track mounted core or reverse circulation types.

6 - TRANSPORTATION

will require pickup truck, flatbed truck, drill rig, haul truck and dump truck. An occasional trip with some vehicle unanticipated at this time may also be required.

7 - FUEL

will normally be transported in quantities not over 250 gallons in tank or barrel containers on a pickup or one of the in going trucks and would be stored inconspicuously away from any streams. Fire extinguishers will be kept on hand.

8 - EXPLOSIVES

will be properly stored in the powder house until taken to their place of use.

9 - TIMBERS

will be hauled in from outside the wilderness area ordinarily, however timbers cut on the claims will be cut out of site of the trails to reduce visual impact. The exception being when a tree poses a hazard along the trail or road. Trees removed in construction of spur roads will be utilized as mine timbers or firewood.

F00528

F00529

10 - WASTE ROCK

will be added to the existing waste dumps in such a manner as to preclude the dumping of new waste rock within 150' of existing drainages.

11 - WATER

will be conducted to the camp and work sites through plastic pipe laid on the ground. with the end of the pipe laid in a creek. No ditches or creek dams are anticipated.

12 - GARBAGE AND REFUSE

will be burned on site and unburnable material will be hauled to a landfill.

13 - CULTURAL RESOURCES

will be preserved if found and activities in that area will cease until the district ranger has been notified and will not resume until authorization to resume has been received from the district ranger.

14 - RECLAMATION

will be of two types;
(1) Seasonal, which will be conducted at the end of operations each season and will consist of having claim roads waterbarred, cut and fill slopes will be seeded with grass as needed where vegetation is not progressing satisfactorily naturally.

(2) Close out, which will be conducted prior to the ending of mining operations and will consist of roads not used as trails by foot or horse traffic being closed with 12" high waterbars and seeded to grass. adjacent trees along closed roads will be allowed to reseed themselves naturally (this has proven to be adequate in the past).

Waste dumps will be recontoured if needed to provide stability.

Mine portals will be caved and otherwise closed if reasonably possible without creating additional surface degradation. These areas will be seeded to grass as needed.

Equipment. machinery. tools and supplies brought in for current mining operations will be hauled out of the wilderness area.

Buildings will be torn down for salvage and/or burned at the option of American Independence Mines and Minerals Inc. (AIMM).

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15 - BONDING

will be covered by the existing bond filed with Payette National Forest by AIMM, covering it's operations at the Antimony Rainbow mine. AIMM proposes to divert it's bond of that operation to that of the Golden Hand operation.

Sincerely,

RICHARD L. ROSS
Consulting Geologist
Idaho State RPG #685

Acting for, AMERICAN INDEPENDENCE MINES AND MINERALS, INC. (AIMM)

cc: Jack A. Walker
Conway G. Ivy
Fred Dauber

F00530

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TTACHMENT 1

SCALE: 1" = 400'

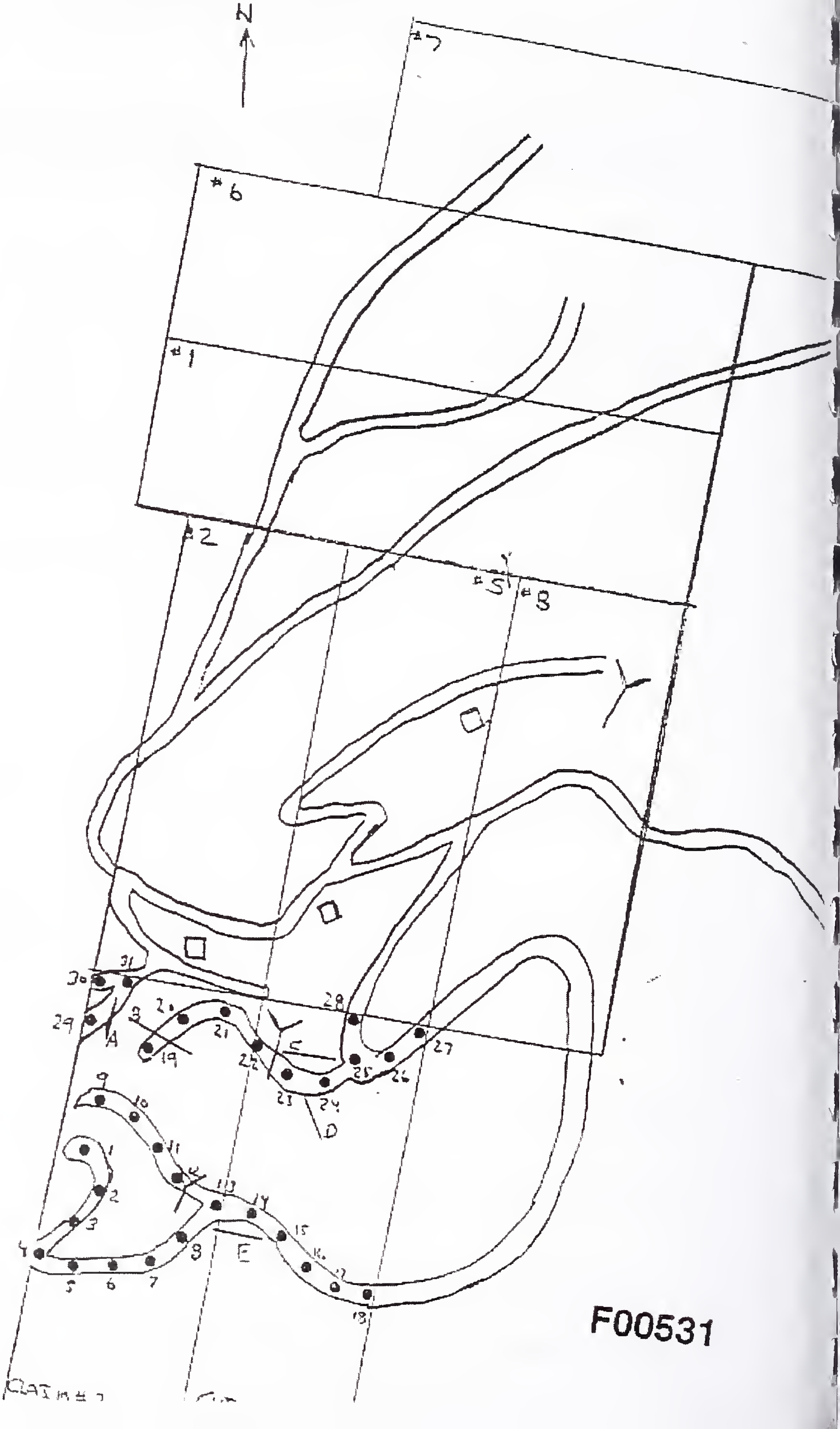
Goldenhand Production
Drilling Array

LEGEND

• 1 DRILL SITE

/A TRENCH SITE

ADIT



F00531

ATTACHMENT 2
page 1 of 3
PRODUCTION DRILL HOLE SPECIFICATIONS

DRILL SITE	HOLE DEPTH (FEET)	HOLE ANGLE (DEGREES)	HOLE DIRECTION (BERING)
1	500	90	
	500	30	N 20 E
2	500	90	
	500	30	N 20 E
3	500	90	
	500	30	N 20 E
4	500	90	
	500	30	N 20 E
5	500	90	
6	500	90	
	500	30	N 20 E
7	500	90	
	500	30	N 20 E
8	500	90	
9	500	90	
	500	30	N 20 E
10	500	90	
	500	30	N 20 E
11	500	90	
	500	30	N 20 E
12	500	90	
	500	30	N 20 E
13	500	90	
	500	30	N 20 E

ATTACHMENT 2

PRODUCTION DRILL HOLE SPECIFICATIONS

DRILL SITE	HOLE DEPTH (FEET)	HOLE ANGLE (DEGREES)	HOLE DIRECTION (BERING)
14	500	90	
	500	30	N 20 E
15	500	90	
	500	30	N 20 E
16	500	90	
	500	30	N 20 E
17	500	90	
	500	30	N 20 E
18	500	90	
19	500	90	
	500	30	N 20 E
20	500	90	
21	500	90	
22	500	90	
23	500	90	
24	500	90	
	500	30	N 20 E
25	500	90	
26	500	90	
27	500	90	
28	500	90	
29	500	90	

ATTACHMENT 2

PRODUCTION DRILL HOLE SPECIFICATIONS

DRILL SITE	HOLE DEPTH (FEET)	HOLE ANGLE (DEGREES)	HOLE DIRECTION (BERING)
30	500	90	
31	500	90	

PRODUCTION TRENCH SPECIFICATIONS
Trenches are all approximately 5' in width and depth

TRENCH SITE	TRENCH LENGTH (FEET)	TRENCH DIRECTION (BERING)
A	100	N 5 E
B	200	N 70 W
C	150	N 85 W
D	150	N 25 W
E	150	N 75 W

EXHIBIT 2: Golden Hand Lode Mining Claims No. 3 and No. 4
Alternative B

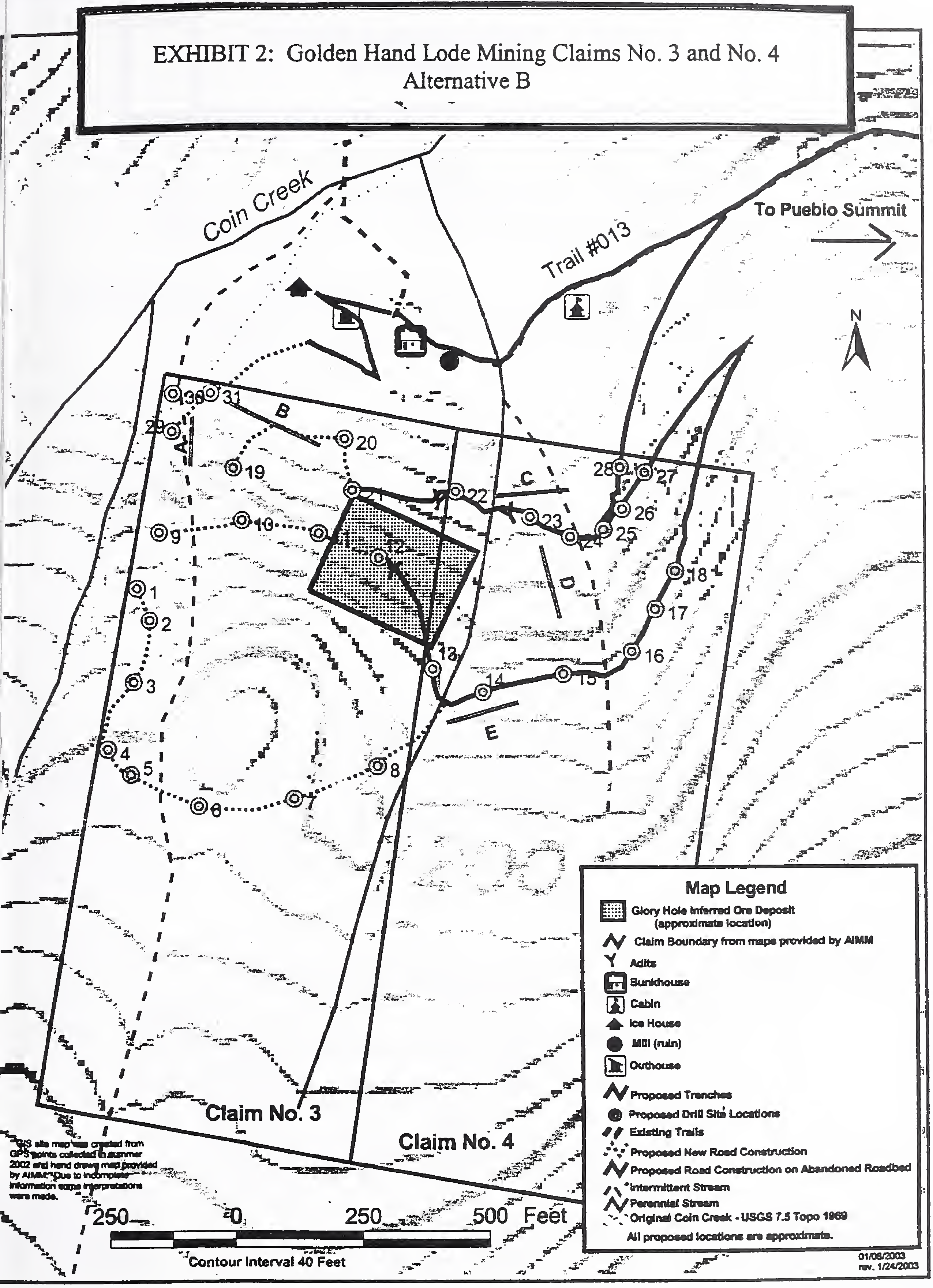
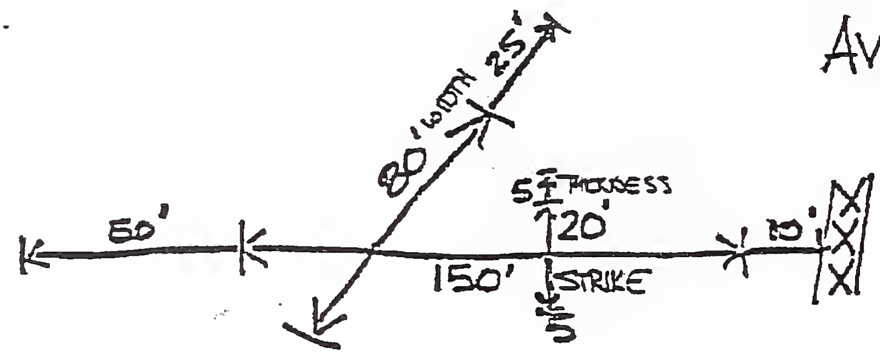


EXHIBIT 3: Vanderwall's Glory Hole
Indicated Reserves

GLORY HOLE

INDICATED RESERVES: BASED ON
62 samples
AVG 0.054 opt
Au



$$\left[\frac{(210')(105')(30')}{12.5 \text{ TONNAGE FACTOR}}\right] - \text{VOID SPACE } 25\%$$

= 52,920 TONS − 13,230 =

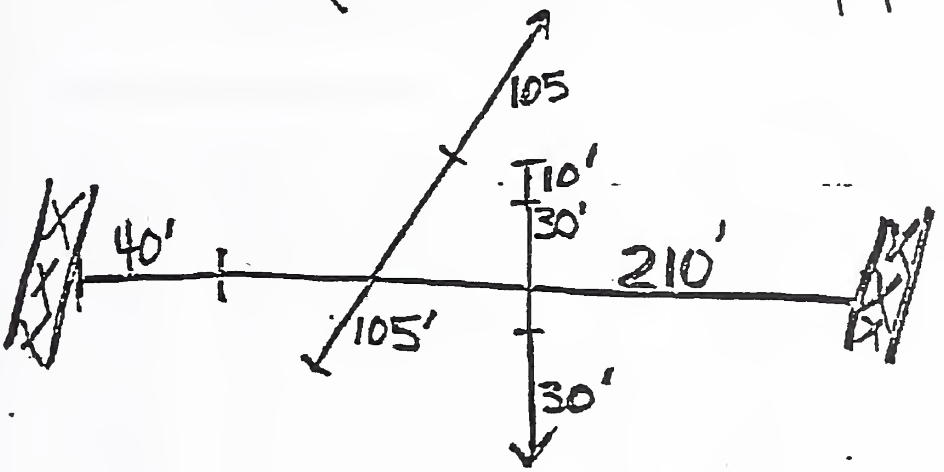
39,690 TONS

2143 OZS GOLD

EXHIBIT 4: Vanderwall's Glory Hole
Inferred Reserves

GLORY HOLE

INFERRED RESERVES: AVG grade 0.054 opt Au



$$\left[\frac{(250)(210)(70)}{12.5 \text{ TONNAGE FACTOR}}\right] - \underset{\text{VOID SPACE}}{13{,}230}$$

$$= \boxed{280{,}770 \text{ TONS}}$$ INDICATED + INFERRED

15,162 OZS GOLD

Exhibit 5: Assay Results from the Glory Hole Deposit

(prepared 01/03 by TRA)

Arith. Avg.(opt Au)		Wtd. Avg. (opt Au)	
61 samp.	0.055	59 samp. (exclu. 2 Thurmond)	0.048

MORGAN'S SAMPLES

Sample Number	Length (inches)	opt Au	wtd.
209	24	0.001	0.02
210	48	0.018	0.86
211	34	**0.056**	1.90
822	72	**0.088**	6.34
823	72	**0.097**	6.98
828	48	0.015	0.72
829	36	**0.045**	1.62
830	44	0.006	0.26
831	39	0.002	0.08
832	65	0.004	0.26
833	64	0.004	0.26
834	42	0.003	0.13
835	54	0.007	0.38
836	37	**0.044**	1.63
837	36	0.022	0.79
838	48	**0.044**	2.11
839	42	0.014	0.59
840	48	0.016	0.77
841	30	0.010	0.30
842	60	**0.048**	2.88
843	44	0.238	10.47
844	48	0.278	13.34
845	32	**0.040**	1.28
846	54	0.018	0.97
847	36	0.028	1.01
848	44	0.036	1.58
849	48	0.014	0.67
	1249	1.196	58.21

Arith. Avg.		Wtd. Avg.	
27 samp.	0.044	0.047	27 samp.

THURMOND'S SAMPLES

Sample Number	Length (inches)	opt Au	wtd.
GH 3-1A	not avail.	0.022	
GH 3-1B	not avail.	**0.070**	
GH 4-1A	48	**0.075**	3.60
GH 4-1B	24	**0.055**	1.32
GH 4-1C	24	**0.120**	2.88
GH 4-2A	82	0.015	1.23
GH 4-2B	46	**0.080**	3.68
GH 4-3	64	**0.050**	3.20
GH 4-4	92	**0.065**	5.98
GH 4-5	64	0.015	0.96
	444	0.567	22.85

Arith. Avg.		Wtd. Avg.	
10 samp.	0.057	0.051	8 samp.

Notes: Assays at or above 0.037 opt Au cutoff grade are boldfaced

Exhibit 5 (page 2): Assay Results from the Glory Hole Deposit
(prepared 01/03 by TRA)

O'HARA'S SAMPLES

Sample Number	Length (inches)	opt Au	wtd.
332	84	0.015	1.26
333	108	0.016	1.73
334	121	0.021	2.54
335	108	0.023	2.48
336	60	0.011	0.66
337	72	0.008	0.58
338	48	0.027	1.30
339	60	0.011	0.66
340	121	0.007	0.85
341	48	**0.041**	1.97
	830	0.18	14.02

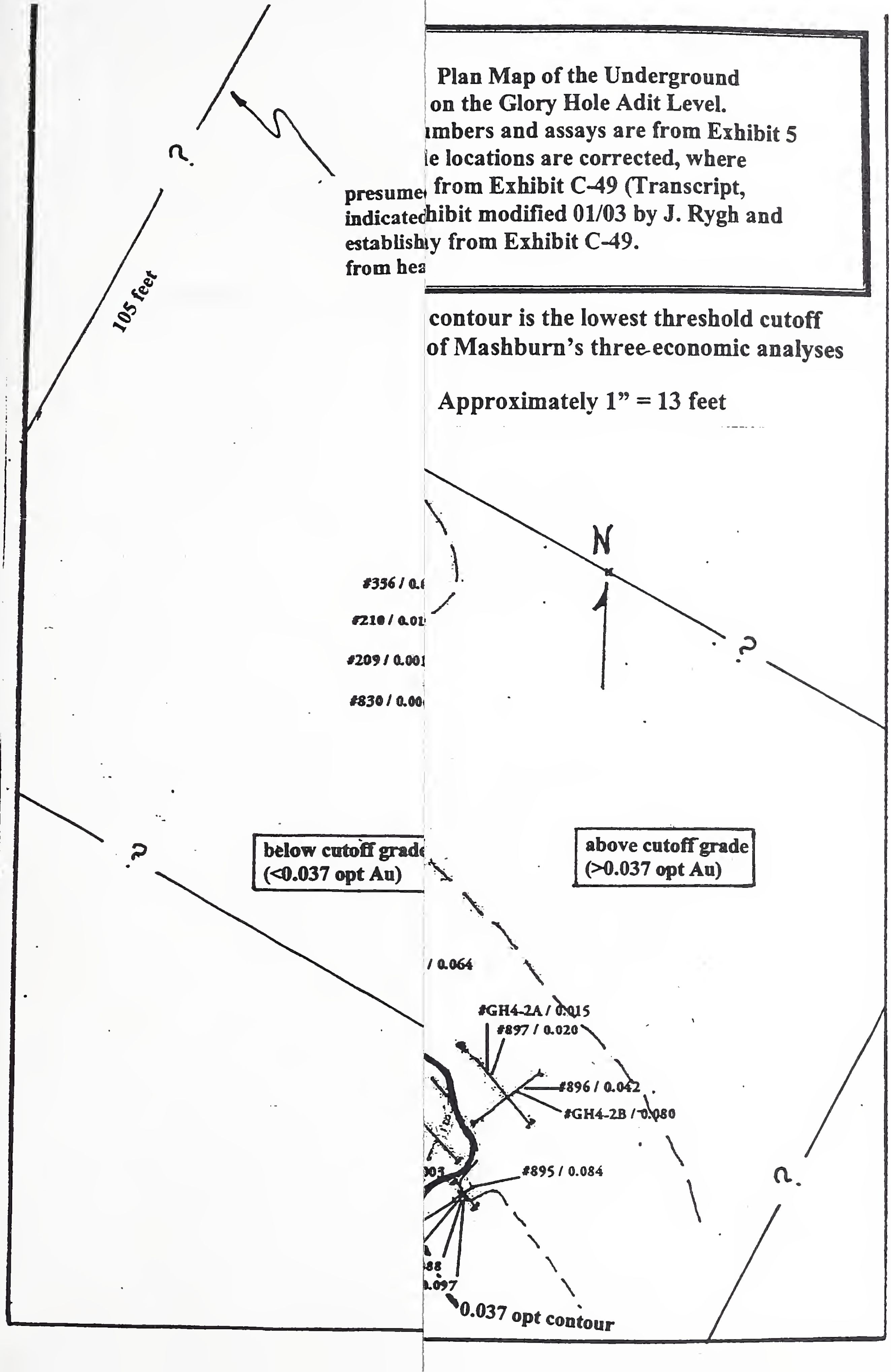
Arith. Avg.		Wtd. Avg.	
10 samp.	**0.018**	**0.017**	10 samp.

HUBBARD'S SAMPLES

Sample Number	Length (inches)	opt Au	wtd.
880	72	**0.306**	22.03
881	36	0.130	4.68
882	72	**0.064**	4.61
883	96	**0.092**	8.83
891	36	0.036	1.30
892	48	**0.072**	3.46
893	48	**0.110**	5.28
894	84	**0.040**	3.36
895	48	**0.084**	4.03
896	108	**0.042**	4.54
897	132	0.020	2.64
898A	52	**0.054**	2.81
898B	37	**0.060**	2.22
899	63	0.010	0.63
	932	1.120	70.41

Arith. Avg.		Wtd. Avg.	
14 samp.	**0.080**	**0.076**	14 samp.

Notes: Assays at or above 0.037 opt Au cuttoff grade are bold-faced


Plan Map of the Underground
on the Glory Hole Adit Level.
ımbers and assays are from Exhibit 5
le locations are corrected, where
presume from Exhibit C-49 (Transcript,
indicatedhibit modified 01/03 by J. Rygh and
establishy from Exhibit C-49.
from hea
contour is the lowest threshold cutoff
of Mashburn's three economic analyses
Approximately 1" = 13 feet
105 feet
N
#356 / 0.
#210 / 0.01
#209 / 0.001
#830 / 0.00
below cutoff grade
(<0.037 opt Au)
above cutoff grade
(>0.037 opt Au)
/ 0.064
#GH4-2A / 0.015
#897 / 0.020
#896 / 0.042
#GH4-2B / 0.080
#895 / 0.084
903
88
.097
0.037 opt contour

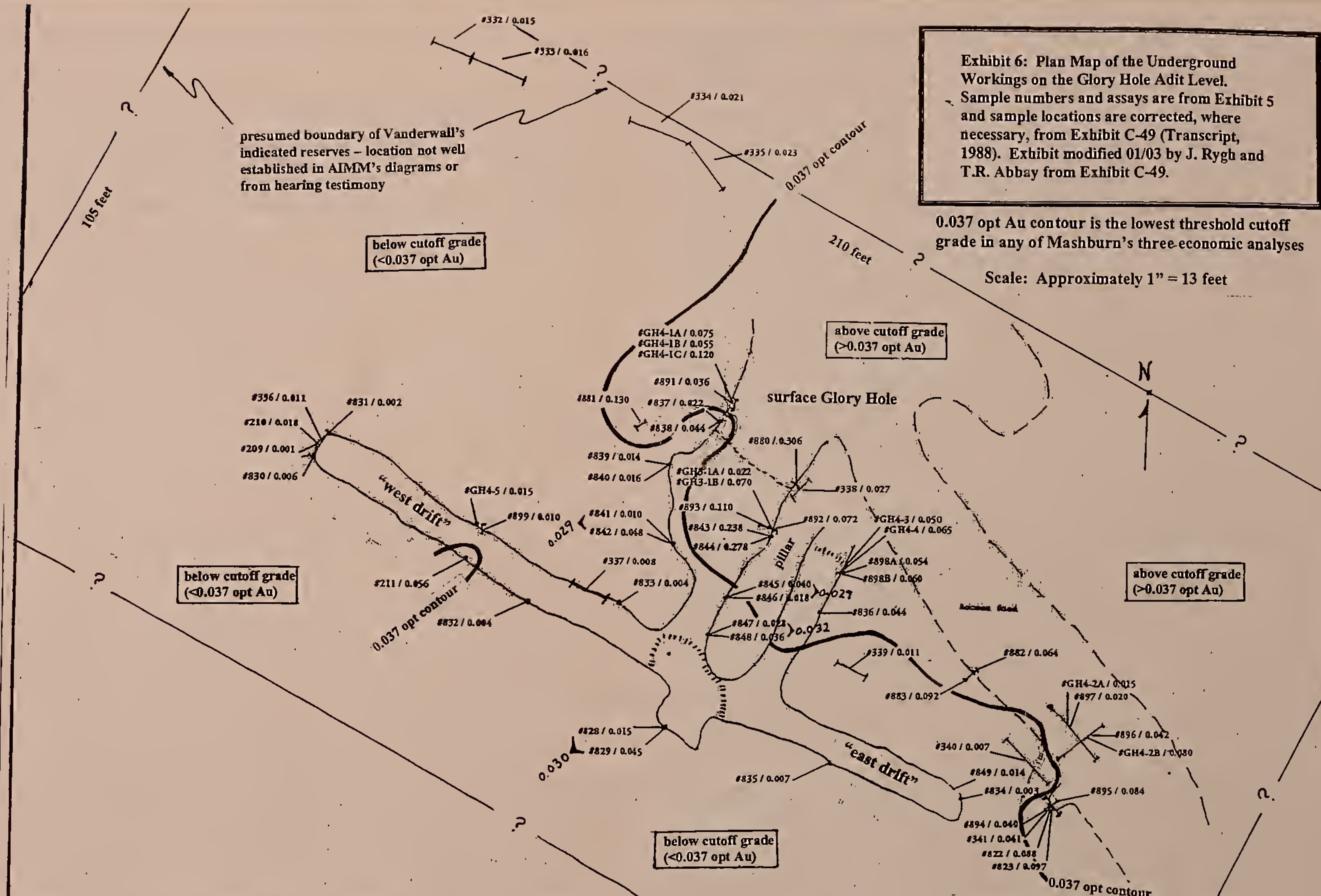


Exhibit 6: Plan Map of the Underground Workings on the Glory Hole Adit Level. Sample numbers and assays are from Exhibit 5 and sample locations are corrected, where necessary, from Exhibit C-49 (Transcript, 1988). Exhibit modified 01/03 by J. Rygh and T.R. Abbay from Exhibit C-49.

APPENDIX C. REQUIREMENTS FOR WILDERNESS OCCUPANCY

Requirements for Wilderness Occupancy

Under Alternative D, an area within one of the valid claims No's. 3, 4, or 8 would be selected for residential occupancy (see Figure 1-3, Chapter 1). The site would be located in an area that is relatively flat and outside the Riparian Habitat Conservation Area (RHCA). The FC-RONR Wilderness Management Plan provides direction for special uses in the wilderness that include provisions for protecting the wilderness resource (USDA 1985 as amended, pp. 56-63). Much of the direction applies to Outfitter and Guide operations, however, it applies directly to the residential occupancy in the Wilderness proposed under Alternative D. The camp occupied by the work crews at the Golden Hand Mine site must follow the same requirements as the Outfitter and Guide camps. Forest Service personnel would monitor the site during each operating season to determine that minimal resource damage is occurring. Failure to comply with the camping requirements would result in an issuance of noncompliance as stated in 36 CFR 228.7.

Camp Condition

1. A temporary camp would be located on one of the valid claims No's. 3, 4, or 8 and would be specifically identified by Forest Service personnel prior to commencement of operations. The temporary camp and associated approved facilities would be dismantled and removed after each operating season. This includes tent frames, base logs, meat racks, outhouses, corrals, saddle sheds and racks, woodsheds, hitch racks, feed bunks, saw bucks, water containment and delivery systems. No permanent facilities would be authorized.

2. No storage of camping-related equipment or non-native materials (such as sawn lumber or plywood) between operating seasons.

3. Pit toilets are mandatory and temporary. Construct a pit toilet at the beginning of each operating season and locate it at least 200 feet from any water source. Use self-standing tents for toilet coverings to promote ease of removal. Fill in the pit toilet and naturalize the site at the end of each operating season.

4. Locate all camp facilities at least 200 feet from trails, streams, and lakes.

5. Cut all firewood needed for each operating season without the use of motorized or mechanized equipment. Only a small amount of firewood should remain at the end of each operating season. Do not cut and store firewood in anticipation of next season's activity.

6. Set up camp no more than 5 days prior to the commencement of actual mining operation each operating season. Remove the camp no more than 5 days after operations end each operating season.

Resource Protection

1. All wilderness regulations must apply to the campsite, specifically no motorized and mechanized use may occur.

2. Obtain prior approval from the Forest Service if live trees are to be cut for constructing camp facilities or for site clearing. Do not notch standing dead or live trees to facilitate installation of a camp facility. Felled trees would be low stumped (as low as possible for large trees, and ground level

for pole-sized trees). To the extent feasible, do not cut trees within 200 feet of live water and Forest Service maintained system trails.

3. Keep camp areas clean and free of litter such as pull-tabs, cigarette butts, hay twine, and foil at all times. Pack out all garbage and dispose of properly. Keep food in bear-proof containers.

4. Keep campfires free of trash such as tin foil, nails, and melted plastic. Naturalize burn pile scars at the end of each operating season by scattering ashes in the brush and spreading needles and twigs over the area. The use of fire pits or pans is recommended; rock rings are unnecessary and discouraged.

5. Do not nail and wire to live trees. Use shims to protect live trees from thin rope.

6. Dump soapy water at least 200 feet from any water source. Dispose of gray water in a sump hole that is at least one foot deep. Fill in and naturalize sump at the end of each operating season.

7. Do not clear or construct new trails without prior written permission from the Forest Service.

Livestock

1. All stock must be supplementally fed and when supplemental feed is used, it must be processed pellets or high quality alfalfa hay and/or grain. Use certified weed-free hay or processed grain.

2. If livestock used for this operation should die within the National Forest, dispose the carcass in a suitable manner more than 200 feet from any water.

3. Where salt for pack and saddle stock is provided, mix with grain. Secure salt in block form off the ground in a waterproof container, away from other camps, trails and live water, and remove when livestock are removed.

4. Do not tie stock directly to trees for longer than 2 hours; use hitch lines or hitch racks, where necessary. Locate stock handling facilities at least 200 feet from lakes, streams, and springs. Scatter manure away from water.

5. Do not allow stock to run loose on trails or travel routes (except where safety requires); stock must be ridden or led.

6. Only stock needed for each trip would be permitted. No cripples, colts, or unbroken stock would be allowed, except for the trip duration if an animal becomes crippled during use.

APPENDIX D.
BEST MANAGEMENT PRACTICES,
WEPP: ROAD INTERFACE MODEL, AND DRILLING MITIGATIONS

Contents

Federal Consistency Checklist for the Golden Hand Mine Project

Pertinent sections of the Water Quality Standards are referenced and need to be used in conjunction with the checklist.

1. Have you identified which nonpoint source activities regulated by the Idaho Water Quality Standards are within the project area?

Yes. Non-point sources identified within the Golden Hand Mine project area are forest road construction, reconstruction and maintenance, and mining.

IDAPA 16.01.02003,62,a-h - Non-point source definitions.

2. Have you identified the state-approved BMPs for each non-point source activity?

Yes. See the BMP list in this appendix.

IDAPA 16.01.02350,03,a-h - List of approved BMPs

3. For non-point source activities that do not have approved BMPs, have you identified practices that demonstrate a knowledgeable and reasonable effort to minimize resulting water quality impacts?

Yes. Mitigation measures for drilling and trenching are described in the Minerals and Geology section of Chapter 3. Mitigation measures for drilling are included in Alternatives C and D.

IDAPA 16.01.02350,02,2 - Non-point source restrictions.

4. Have you provided a monitoring plan which, when implemented, will provide adequate information to determine effectiveness of the approved or specialized BMPs in protecting the beneficial uses of water?

Yes. The monitoring plan is included in the Appendix of the NEPA document.

IDAPA 16.01.02350,02,3cii - Monitoring plan requirements (Appendix E).

5. Have you provided a process (including feedback from water quality monitoring) for modifying the approved or specialized BMPs in order to protect the beneficial uses of water?

Yes. The monitoring plan includes confirming the implementation and effectiveness of BMPs and SWCPs. This process is tied to the Feedback Loop Process for Non-point Source Control, in which BMPs are evaluated and modified as necessary in order to protect the beneficial uses of water.

IDAPA 16.01.0235002,02,3ciii - Modification of BMPs.

6. Have you identified the "appropriate beneficial uses" of water for the water bodies in the project area?

Yes. Beneficial uses for Big Creek, SB-440, include; Domestic Water Supply, Agricultural Water Supply, Cold Water Biota, Salmonid Spawning, Primary Contact Recreation, Secondary Contact Recreation, and Special Resource Water.

IDAPA 16.01.02003,04 - Definition of beneficial use.
IDAPA 16.01.02100,01-05 - Water use classification.
IDAPA 16.01.02101,01-03 - Water use designation.
IDAPA 16.01.02140,01 - Southwest Idaho Basin.

7. Have you incorporated the State Antidegradation Policy into the project plan?

Yes. Under alternatives C and D, existing water quality would be maintained and protected as required by the State Antidegradation Policy. This would be accomplished through the implementation of BMPs and other mitigation measures, adherence to PACFISH standards, and protection of RHCAs. Alternative D best meets the policy.

IDAPA 16.01.02003,115 - Definition of Water Quality Limited Water Body.
IDAPA 16.01.02051,01-03 - Antidegradation Policy.

8. Have you determined if an Outstanding Resource Water (ORW) has been designated in the project area?

Yes. There are no Outstanding Resource Waters within the project area, however Big Creek is designated as a Special Resource Water.

IDAPA 16.01.02003,70 - Definition of ORW.
IDAPA 16.01.02055,01-06 - Outstanding Resource Waters.

9. Have you identified the water quality standards and criteria applicable to protecting the "appropriate beneficial uses"?

Yes. See below.

IDAPA 16.01.02200 – 02280 - Surface water quality criteria.

10. Does pre-project planning and design include an analysis of water quality resulting from implementation of the proposed activity sufficient to predict exceeding water quality criteria for the appropriate beneficial use(s), or in the absence of such criteria, sufficient to predict the potential for beneficial use impairment?

Yes. Sediment delivery modeling and baseline chemical analysis of water from Coin Creek have been completed. A water quality monitoring program has been designed (see Appendix E).

IDAPA 16.01.02050,02 - Administrative policy.
IDAPA 16.01.02300,02 - Limitation to discharge of pollutants.

Idaho Water Designation Abstracts

Surface Water Quality Beneficial Use Designations*

Agricultural Water Supply: Waters that are suitable or intended to be made suitable for the irrigation of crops or as drinking water for livestock (Source: IDAPA 16.01.0200,01a). *Criteria:* General surface water quality criteria. Narrative or "free-form" criteria for hazardous materials, deleterious materials, floating, suspended, or submerged matter, excess nutrients, oxygen demanding materials and sediment. Numeric criteria for radioactive materials (Source: IDAPA 16.01.02250,03.a).

Domestic Water Supply: Waters that are suitable or intended to be made suitable for drinking water supplies (Source IDAPA 16.01.02100,01.b). *Criteria:* Numeric criteria for specific constituents (Source: IDAPA 16.01.02250,03.a).

Cold Water Biota: Waters that are suitable or intended to be made suitable for protection and maintenance of viable communities of aquatic organisms and populations of significant aquatic species that have optimal growing temperatures below 18 degrees C (Source: IDAPA 16.01.02100,02.a). *Criteria:* Numeric criteria for pH, dissolved oxygen, gas saturation, residual chlorine, water temperature and total ammonia (Source: IDAPA 16.01.02100,02.a, b).

Salmonid Spawning: Waters that provide or could provide habitat for active self-propagating populations of salmonid fishes (Source: IDAPA 16.01.0200,02.c). *Criteria:* Numeric criteria for pH, gas saturation, residual chlorine, dissolved oxygen, water temperature and total ammonia (Source: IDAPA 16.01.02250,02.a and d).

Primary Contact Recreation: Surface waters that are suitable or are intended to be made suitable for prolonged and intimate contact by humans or for recreational activities when the ingestion of small quantities of water is likely to occur. Such waters include, but are not restricted to, those used for swimming, water skiing, or skin diving (Source: IDAPA 16.01.02100,03.a). *Criteria:* Numeric criteria applied between May 1st and September 30th (recreation season) for fecal coliform bacteria (Source: IDAPA 16.01.02250,01.a).

Secondary Contact Recreation: Surface waters that are suitable or are intended to be made suitable for recreational uses on or about the water and which are not included in the primary contact category. These waters may be used for fishing, boating, wading, and other activities where ingestion of raw water is not probable (Source: IDAPA 16.01.02100,04). *Criteria:* Numeric criteria for fecal coliform bacteria (Source: IDAPA 16.01.02250, 01.b).

Wildlife Habitats: Waters that are suitable or are intended to be made suitable for wildlife habitats. This use applies to all surface waters of the state (Source: IDAPA 16.01.02100,04). *Criteria:* General surface water quality criteria (Source: IDAPA 16.01.02200).

Aesthetics: This use applies to all surface waters of the state (Source: IDAPA 16.01.02100,05). *Criteria:* General surface water quality criteria (Source: IDAPA 16.01.02200).

Groundwater Use Classifications

Agricultural Water Supplies: Waters that are suitable or intended to be made suitable for the irrigation of crops or as drinking water for livestock (Source: IDAPA 16.01.02250,03.a).

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* Different criteria apply to stream segments or water bodies that have been assigned site-specific criteria.

Criteria: General groundwater quality criteria. Narrative or "free-form" criteria for hazardous materials and deleterious materials (Source: IDAPA 16.01.02299,04.a and b). Numeric criteria for radioactive materials (Source: IDAPA 16.01.02299,04.c and d).

Domestic Water Supplies: Waters that are suitable or intended to be made suitable for drinking water supplies (Source: IDAPA 16.01.02299,04.a and b). *Criteria:* Numeric criteria for specific constituents (Source: IDAPA 16.01.02250,03.a).

Special Designations

Special Resource Water: Those specific segments or bodies of water that are recognized as needing intensive protection to preserve outstanding or unique characteristics, or to maintain current beneficial use (Source: IDAPA 16.01.02003,54). For special resource waters, new or modified point sources of pollution cannot be allowed unless there is no measurable change in the quality of the receiving water body after allowing for an applicable mixing zone.

Designations as a special resource water recognizes at least one of the following characteristics: (a) the water is of outstanding high quality, exceeding both criteria for primary contact recreation and cold water biota: (b) the water is of unique ecological significance; (c) the water possesses outstanding recreational or aesthetic qualities; (d) intensive protection of the quality of the water is in paramount interest of the people within a State or National Wild and Scenic River System; or (e) intensive protection of the quality of the water is necessary to maintain an existing but jeopardized beneficial use (Source: IDAPA 16.01.02054,01).

Water Quality Limited Segment: Any segment where it is known that water quality does not meet applicable water quality standards, and/or is not expected to meet applicable water quality standards, even after the application of the technology-based effluent limitations required by sections 301(b) and 306 of the Clean Water Act (Source: 40 CFR Chapter 1, Section 130,2(j)). Water quality limited segments are to be prioritized for total maximum daily load development. Designation as a water quality limited segment is based on water quality data.

Wild and Scenic River: Under the Wild and Scenic Rivers Act (P.L. 90-542 as amended) a river or a section of a river may be classified as a *Wild*, *Scenic* or *Recreational*. *Wild Rivers* are those rivers or sections of rivers that are free of impoundments and generally inaccessible except by trail, with watersheds and shorelines essentially primitive and unpolluted. They represent vestiges of primitive America. *Scenic Rivers* are those rivers or sections of rivers that are free of impoundments, with shorelines or watersheds still largely primitive and shorelines largely undeveloped, but accessible in places by roads.

State Water Quality Standards

State 319 Update

The Idaho Division of Environmental Quality (DEQ) is responsible for the overall coordination and implementation of the state's nonpoint source programs. Implementation of the Nonpoint Source Management Program is accomplished through interagency coordination with local, state, and federal natural resource agencies. The nonpoint source programs are implemented with assistance from public advisory committees, which provide continuous feedback on the direction and acceptability of the nonpoint source control strategy.

The US Forest Service is the designated water quality management agency for National Forest System lands. Water quality on National Forest lands is managed pursuant to Section 208 of the Clean Water Act. The Forest Service is responsible for complying with State Water Quality Standards that require the control of nonpoint sources of pollution, and has an agreement with Idaho Department of Health and Welfare and the DEQ to do this through the implementation of Best Management Practices on National Forest System lands. For mining projects, the relevant state guidelines can be found in the Manual of Best Management Practices for Mining in Idaho (Idaho Department of Lands 1992). Forest Service compliance with these state BMPs will be accomplished through the implementation of Soil and Water Conservation Practices (SWCPs) described in Forest Service Handbook 2509.22. The USFS will monitor compliance with the plan of operations and implementation of the BMPs as called for in a 1993 Interagency Memorandum of Understanding appendix that specifies implementation of the mining water quality program.

The USFS must also comply with Idaho Department of Water Resources requirements for stream channel protection codified at IDAPA 37.03.07 ("Stream Channel Alteration Rules"). This requires the issuance of a Stream Channel Alteration Permit for any projects involving work done within the beds and banks of a continuously flowing stream.

Administration of the National Forests is mandated by a number of federal laws and executive orders in addition to the Clean Water Act, that require protection of water quality and management of multiple uses of the Forest. The Payette National Forest utilizes Standards and Guidelines for Soil and Related Resources along with the Land and Resource Management Plan for the Forest. Responsibilities for managing riparian areas are assigned to the Forest Service under the National Forest Management Act (NFMA). There are also Forest-wide standards and guidelines for Riparian Management.

The nonpoint source control strategy is based on the feedback loop concept. BMP's are the backbone of this control program. A process for site-specific application of BMP's is developed under each nonpoint source program, and monitoring is used to evaluate the effectiveness of the BMP's. Changes to BMP's are recommended when they do not support the beneficial uses; monitoring continues to assure that the revised practices are adequate (The 1992 Idaho Water Quality Status Report, Idaho Department of Health and Welfare, Division of Environmental Quality, December 1992).

The nonpoint source program emphasizes the following actions:

- Building on the strength of existing nonpoint programs, such as agriculture and forestry.

- Focusing evaluation and monitoring techniques on beneficial use assessments and BMP effectiveness.
- Creating public awareness and support through information, education, and citizen participation.
- Institutionalizing the feedback loop components in state and federal agency programs
- Using the Clean Water Act requirements.
- Integrating the nonpoint source control program with implementation of the Antidegradation Policy.

FEEDBACK LOOP PROCESS
for
Nonpoint Source Control

1. **INSTREAM CRITERIA**, which are developed to protect the beneficial uses of water <u>OR</u> where there presently are no criteria - impairment to beneficial uses, which

is the basis for development and modification of

2. LAND MANAGEMENT PRACTICES or Best Management Practices (BMPs) Voluntary for some NPS activities mandatory for others

See Table D-1 for BMPs. The BMPs are

3. **IMPLEMENTED** ON-SITE

The effectiveness of the BMPs in protecting water quality is evaluated through

4. INSTREAM WATER QUALITY MONITORING

This data is then evaluated against the

BMP Effectiveness Ratings

This part of the appendix describes standard Best Management Practices (BMPs) commonly used on the Payette National Forest to minimize effects of timber management and associated activities on soil and water resources. The purpose of the following table is to:

1. Establish the connection between the SWCP employed by the Forest Service and the guidelines described in the Manual of BMPs for the Mining Industry in Idaho.
2. Provide a qualitative assessment of expected effectiveness that the implemented BMP will have on preventing or reducing impacts on soil and water resources.

The BMPs described herein are tiered to the Soil and Water Conservation Practices (SWCP) Handbook (FSH 2509.22) which is a supplemental document to the Forest Plan. This appendix does not cover all possible practices contained in the Forest Service Handbook, but it does represent the more common practices used to meet State and Forest management objectives. All reasonable practices will be implemented where applicable in the design of selected projects. The District Ranger is responsible for ensuring that all relevant SWCPs are incorporated into an approved plan of operations. The Minerals Program Manager, through official representative(s), is responsible for ensuring that these provisions are properly administered on the ground.

Each Soil and Water Conservation Practice is described as follows:

Title: Includes the sequential number of the SWCP and a brief title.

Objective: Describes the objective(s) and desired results for protecting soil and water resources.

Effectiveness: Provides a qualitative assessment of expected effectiveness that the implemented practice will have on preventing or reducing impacts on soil and water resources. The SWCP effectiveness rating is based on the following criteria:

a. Literature/Research (must be applicable to area).
b. Administrative studies (local or within similar ecosystem).
c. Experience (judgement of qualified personnel by education and/or experience).
d. Fact (obvious by reasoned, logical, response).

The expected effectiveness of the SWCP is rated High, Moderate or Low:

HIGH: Practice is highly effective (greater than 90%), meets one or more of the rating criteria, and documentation is available.

MODERATE: Documentation shows that practice is 75 to 90 percent effective; or logic indicates that practice is highly effective, but there is no documentation to back it up. Implementation and effectiveness will be monitored and the practice will be modified if necessary to achieve the mitigation objective.

LOW: Effectiveness is unknown or unverified, and there is little or no documentation; or applied logic is uncertain and practice is estimated to be less than 60 percent effective. This practice is speculative and needs both effectiveness and validation monitoring.

Many of the SWCPs listed pertain to road construction/reconstruction. The effectiveness of measures used to implement these SWCPs is summarized in a recent technical bulletin by the National Council for Air and Stream Improvement (NCASI, 2000).

Idaho Mining BMPs

Identifies specific Idaho Mining BMPs that the implemented practice would meet or exceed.

Key Soil and Water Conservation Practices

Class *Soil and Water Conservation Practice (FSH 2509.22)

11 Watershed Management

A 11.01 Determination of Cumulative Watershed Effects
A 11.02 Soil and Water Resource Monitoring and Evaluation
W 11.05 Wetlands Analysis and Evaluation
W 11.07 Oil and Hazardous Substance Spill Contingency Planning

15 Roads and Trails

A 15.02 General Guidelines for Road Location/Design
E 15.03 Road and Trail Erosion Control Plan
E 15.04 Timing of Construction Activities
E 15.05 Slope Stabilization and Prevention of Mass Failures
E 15.06 Mitigation of Surface Erosion and Stabilization of Slopes
E 15.07 Control of Permanent Road Drainage
E 15.08 Pioneer Road Construction
E 15.09 Timely Erosion Control Measures on Incomplete Road and Streamcrossing Projects
E 15.10 Control of Road Construction Excavation & Sidecast Material
S 15.11 Servicing and Refueling of Equipment
S 15.12 Control of Construction In Riparian Areas
S 15.13 Controlling In-Channel Excavation
S 15.15 Stream crossings on Temporary Roads
E. 15.17 Regulation of Borrow Pits, Gravel Sources and Quarries
E 15.18 Disposal of Right-of-Way and Roadside Debris
S 15.19 Streambank Protection
E 15.21 Maintenance of Roads
E 15.22 Road Surface Treatment to Prevent Loss of Materials
E 15.23 Traffic Control During Wet Periods
G 15.24 Snow Removal Controls
E 15.25 Obliteration of Temporary Roads

16 Minerals

A. 16.01 Administration of the General Mining Law (Act of May 10, 1872) for Mineral Exploration and Extraction on National Forest System Lands

*** Classes of SWCP (BMP)**

A = Administrative
E = Erosion Reduction
S = Stream Channel Protection/Stream Sediment Reduction
G = Ground Disturbance Reduction
W = Water Quality Protection

Table D-1. Best Management Practices Crosswalk

BMP Title	Purpose or Objective	Effectiveness	Relevant Chapters & BMP Sections of Idaho Mining BMP Manual
SWCP 11.01 - Determination of Cumulative Watershed Effects	Analyze changes in beneficial water uses due to accumulation of individual impacts.	MODERATE	No related sections
SWCP 11.02 - Soil and Water Resource Monitoring and Evaluation	Provide feedback mechanism to compare results of implementing SWCPs with previous conditions, desired end-products, and State standards.	MODERATE	No related sections
SWCP 11.05 - Wetlands analysis and evaluation.	Maintain wetland functions and avoid adverse soil and water resource impacts associated with the destruction or alteration of wetlands, bogs, and wet meadows.	HIGH	No related sections
SWCP 11.07 - Oil and Hazardous Substance Spill Contingency Planning	Prevent contamination of soil and water resources resulting from leaking delivery systems and storage facilities.	HIGH	Ch. 7
SWCP 15.02 - General guidelines for location and design of roads and trails.	Locate and design roads and trails with minimal soil and water resource impacts while considering all design criteria.	MODERATE	Ch. 1 BMP sec. I
SWCP 15.03 - Road and trail erosion control plan.	Prevent, limit, and mitigate erosion and sedimentation through timely implementation of erosion control practices prior to and during ground-disturbing activities.	MODERATE	Ch. 1 BMP secs. I,III,V
SWCP 15.04 - Timing of construction activities	To minimize erosion by conducting operations during minimal runoff periods.	MODERATE	Ch. 1 BMP sec.I
SWCP 15.05 - Slope stabilization and prevention of mass failures	To reduce sedimentation by minimizing the chances for road-related mass failures, including landslides and embankment slumps.	MODERATE	Ch. 1
SWCP 15.06 - Mitigation of surface erosion and stabilization of slopes.	Minimize soil erosion and sedimentation from road cut slopes, fill slopes, and travelways during and after construction.	MODERATE	Ch. 1 BMP secs. I
SWCP 15.07 - Control of permanent road drainage.	Minimize the erosive effects of concentrated water and the degradation of water quality through proper design and construction of road drainage systems and control structures.	MODERATE	Ch. 1 BMP secs. III
SWCP 15.08 - Pioneer road construction.	Minimize sediment production and mass wasting associated with pioneer road construction.	MODERATE	Ch. 1 BMP secs. I, III, V
SWCP 15.09 - Timely erosion control measures for incomplete roads and stream crossings.	To minimize accelerated erosion and sedimentation from disturbed ground created by ongoing incomplete projects.	MODERATE	Ch. 1 BMP secs. I, III, V
SWCP 15.10 - Control of road construction excavation and sidecast.	To reduce sedimentation from unconsolidated excavated and sidecast material caused by road construction, reconstruction, or maintenance.	HIGH	Ch. 1 BMP secs. I, V
SWCP 15.11 - Servicing and refueling of equipment.	Prevent contamination of water from accidental spills of fuels, lubricants, bitumens, raw sewage, wash water, and other harmful materials.	HIGH	Ch. 7
SWCP 15.12 – Control of construction in riparian areas	To minimize the adverse effects on riparian areas from roads and trails.	MODERATE	Ch. 1 BMP secs. I, III, V

BMP Title	Purpose or Objective	Effectiveness	Relevant Chapters & BMP Sections of Idaho Mining BMP Manual
SWCP 15.13 - Controlling in-channel excavation	To minimize stream channel disturbances and related sediment production.	MODERATE	Ch. 1 BMP secs. III, V
SWCP 15.15 - Stream crossings on temporary roads.	Keep temporary roads from unduly damaging streams, disturbing channels, or obstructing fish channels.	MODERATE	Ch. 1 BMP sec. 1
SWCP 15.17 - Regulation of borrow pits, gravel sources, and quarries.	Minimize sediment production from borrow pits, gravel sources, and quarries, and limit channel disturbances in those gravel sources suitable for development in floodplains.	HIGH	Ch. 1 BMP secs. I, III
SWCP 15.18 - Disposal of right-of-way and roadside debris.	To insure that debris generated during road construction is kept out of streams and to prevent slash and debris from subsequently obstructing channels.	HIGH	Ch. 1 BMP secs. V
SWCP 15.19 - Streambank protection.	To minimize sediment production from streambanks and structural abutments in natural waterways.	MODERATE	Ch. 1 BMP secs. I
SWCP 15.21 - Maintenance of roads.	Conduct regular preventive maintenance operations to avoid deterioration of the road surface and minimize disturbance to water quality and fish habitat.	MODERATE	Ch. 1 BMP secs. I, III
SWCP 15.22 - Road surface treatment to prevent loss of materials.	Minimize the erosion of road surface materials and reduce the likelihood of sediment production.	HIGH	Ch. 1
SWCP 15.23 - Traffic control during wet periods.	Reduce the potential for road surface disturbance during wet weather and reduce sedimentation probability.	MODERATE	Ch. 1 BMP secs. III
SWCP 15.24 - Snow removal controls.	Minimize impacts of snow melt on road surfaces and embankments and reduce the probability of sediment production resulting from snow removal operations.	MODERATE	
SWCP 15.25 - Obliteration of temporary roads.	Reduce sediment generated from temporary roads by obliterating them upon completion of their intended use.	HIGH	Ch. 1 BMP secs. I, II, III
SWCP 16.01 - Administration of the General Mining Law (Act of May 10, 1872) for Mineral Exploration and Extraction on National Forest System Lands.	To protect water quality from degradation by physical and chemical constituents which may result from mining and associated activities.	MODERATE	Ch. 1 ,7 BMP sec. III

WEPP:Road Interface Model for Predicting Forest Road Runoff, Erosion and Sediment Delivery

Introduction

This appendix presents the findings of a sediment yield assessment completed for the Golden Hand Mine Environmental Impact Statement (EIS). Quantitative sediment yield modeling was completed for the water quality analyses presented in the EIS. Please refer to the EIS for the project description and other details of the alternatives.

The Water Erosion Prediction Project (WEPP) Interface for predicting forest road runoff, erosion, and sediment delivery (WEPP:Road) was selected for this project because:

1. The WEPP:Road model was developed specifically for this application
2. Inputs to the WEPP model are readily available
3. The model provides output that can be used in decision-making

WEPP:Road is an interface to the Water Erosion Prediction Project (WEPP) soil erosion model that allows users to easily describe numerous road erosion conditions (Flanagan and Livingston 1995). WEPP:Road is linked to the Rock:Clime climate generator with a database of more than 2,600 weather stations. WEPP:Road is one in a series of the USDA Forest Service's Internet-based computer programs based on the Agricultural Research Service's Water Erosion Prediction Project (WEPP) model. WEPP:Road is designed to predict runoff and sediment yield from roads, compacted landings, compacted skid trails, compacted foot, cattle, or off-road vehicle trails. WEPP:Road allows the user to specify the characteristics of the road in terms of climate, soil and gravel addition, local topography, drain spacing, road design and surface condition, and ditch condition.

WEPP simulates the conditions that impact erosion for every day in a multiple-year run. For each day that has a precipitation event, WEPP determines whether the event is rain or snow, and calculates the infiltration and runoff. If there is runoff, WEPP routes the runoff over the surface, calculating erosion or deposition rates. It then calculates the average sediment yield from the hillslope. The WEPP model allows a hillslope to be divided into segments with similar soils and vegetation, called overland flow elements. WEPP:Road assumes there are three overland flow elements: a road, a fillslope, and a forest.

WEPP:Road Assumptions

Because WEPP is process-based, it can be applied to any condition where the necessary input data are known. WEPP is difficult to apply, however, because of the amount of input data required. To simplify the application of WEPP to forest roads anywhere in the U.S., a custom interface (WEPP:Road) was developed for the road/buffer scenario. Climate for the area is generated from a climate database. Soil properties are based on research findings. The road is assumed to be free of vegetation, the fillslope to be covered with sufficient vegetation to give about 50 percent ground cover, and the buffer surface covered with litter from a 20-year old forest, generally 100 percent.

Climate

The Rock:Clime weather generator was used to establish a local climate for the project area (Table D-2 and Table D-3). The generator uses the climate statistics from the selected station to generate a daily weather sequence for the number of years specified. The WEPP model reads the generated daily weather to complete the erosion estimates. Preliminary runs were performed using the generated local climate to determine how many years of run were necessary to ensure a stable long-term average erosion value. For the Golden Hand Mine site, 30 years was adequate.

Table D-2. Climate Parameters used in the WEPP:Road Analysis for the Golden Hand Mine DEIS.

Month	Mean Maximum Temperature (°F)	Mean Minimum Temperature (°F)	Mean Precip. (in.)	Number of wet days
January	28.4	4.0	5.79	9.3
February	34.2	7.2	4.02	7.4
March	37.9	9.6	4.32	8.6
April	44.6	16.5	3.24	8.5
May	53.8	23.7	3.52	9.8
June	63.5	29.6	3.68	8.8
July	72.7	32.2	1.54	4.7
August	71.7	30.6	1.80	5.4
September	62.2	25.0	2.41	6.2
October	51.6	19.4	2.99	7.3
November	35.5	12.5	4.83	10.5
December	27.9	5.5	5.17	10.0
Annual			43.30	96.5

(1/10/2003 Climate parameters for Golden Hand + 45. 13°N 115.16°E; 7236 feet elevation)

Table D-3. Detailed Input and Output for WEPP:Road model runs - Golden Hand DEIS

Station	Weighting	Station	Weighting
Wind Stations		**Solar Radiation and Max .5 P Stations**	
LEWISTON ID	38.9 %	BOISE, IDAHO	39.9 %
BOISE ID	32.5 %	MEACHUM, OREGON	35.9 %
MISSOULA MT	28.6 %	HELENA, MONTANA	24.2 %
Dewpoint Stations		**Time-to-Peak Stations**	
LEWISTON ID	38.9 %	YELLOW PINE 7 S ID	42.6 %
BOISE ID	32.5 %	MC CALL ID	36.3 %
MISSOULA MT	28.6 %	FENN RS ID	21.1 %

Modified by Rock:Clime on January 10, 2003 from WARREN ID 109560 0

Soil Texture

The erosion potential of a given soil depends on the soil texture. Four soil textures (silt loam, clay loam, sandy loam and loam) are listed for WEPP:Road. Sandy loam was chosen as representative of soil textures in the analysis area for all model runs (see Table D-4).

Road Design

There are four road designs options on the WEPP:Road menu – Insloped with bare ditch, insloped with vegetated or rocked ditch, outsloped rutted, and outsloped unrutted. All roads in the analysis area were modeled as outsloped (Table D-4). Two outsloped options are available--with and without ruts. The "Outsloped, unrutted" design best descibes the road condition immediately following blading or for closed roads. With traffic, however, wheel tracks soon begin to flatten, and runoff tends to follow wheel tracks from one surface cross drain to the next. The "Outsloped, rutted" option generally is the most appropriate selection for an outsloped road and was used for all of the model runs for roads. The outsloped, rutted option assumes a rill spacing of 2 m, similar to the spacing of the wheel tracks. The insloped with bare ditch option was used for the trenches to account for concentrated channel flow in or adjacent to the trench.

Gravel Addition

WEPP:Road provides options for three road surface conditions: native, graveled, and paved. The graveled selection alters the soil file by increasing the rock content and the hydraulic conductivity of the soil. The addition of gravel has two major impacts on erosion rate. Research has shown that gravel alters the hydraulic conductivity of a soil, and it changes the flow path length of the road (Foltz and Truebe 1995). Generally, the addition of gravel increases the porosity and increases the hydraulic conductivity of the road, which decreases the runoff (Flerchinger and Watts 1987). The increase in conductivity may not result in a decrease in erosion. In areas where runoff is due to saturated conditions rather than to rainfall rates exceeding hydraulic conductivity, runoff may be similar, or even greater, following an increase in road conductivity, because the road is more likely to be saturated. Most roads and trenches in the project area were modeled using the native option in WEPP:Road. The graveled option was used for the access road in Alternatives C and D because these alternatives propose gravel addition to roads at stream crossings (Table D-4).

Topography

The flow lengths along the road surfaces were estimated from topographic maps, the wetland surveys and the professional judgement of the Forest road engineer. To estimate the sediment delivery at a stream crossing without a culvert, it was assumed that all of the road prism erosion enters the stream. This method does not include any erosion or deposition on a fill slope. The alternative method of selecting the minimum lengths for the fillslope and buffer lengths and using the sediment leaving the buffer was not used as it may overestimate deposition on the fill or buffer (Elliot et al. 1999). For crossings with culverts the fillslope was assumed to be 2 feet long at a slope of 50 percent, and the buffer was assumed to be 6 feet long at a slope of 25 percent.

Road Width

Road widths were assumed to be 10 feet for the existing condition and for Alternatives C and D, and 12 feet for Alternative B. This is because the blading and reconstruction of roads proposed in Alternative B generally produces a road width of not less than 12 feet. Trenches were assumed to be 25 feet wide including the excavation and the adjacent soil pile.

Accuracy and Validation

Predicted runoff or erosion values by the model are, at best, within plus or minus 50 percent of the true value. Erosion rates are highly variable, and the model predicts only a single value. Replicated research has shown that observed erosion values vary widely for identical plots, and for the same plot from year to year (Elliot and others 1994; Elliot and others 1995; Tysdal and others 1999). The WEPP model has been validated for several different road/stream configurations (Elliot and others 1994).

Table D-4. WEPP:Road input parameters and assumptions for the Golden Hand Mine DEIS.

	Time Period Modeled (years)	Road Surface Soil Texture	Road Design	Road Surface	Width (feet)	Mitigations
Alt A access roads	30	Sandy loam	Outsloped/rutted	native	10	none
Alt B access roads	30	Sandy loam	Outsloped/rutted	native	12	2 cross drains installed, no culverts
Alt B mine roads	30	Sandy loam	Outsloped/rutted	native	12	2 cross drains installed
Trenches	30	Sandy loam	Insloped/bare ditch	native	25	Open all year
Alt C access roads	30	Sandy loam	Outsloped/rutted	graveled	10	All cross drains and culverts installed
Alt C mine roads	30	Sandy loam	Outsloped/rutted	native	10	All cross drains installed
Alt D access roads	30	Sandy loam	Outsloped/rutted	graveled	10	All cross drains and culverts installed

A total of 33 sediment delivery points to streams were modeled. Twenty-two of these are stream crossings along roads in the Logan Creek, Smith Creek, and North Fork Smith Creek drainages. Eleven are in the mine area in the Coin Creek drainage, three of which are related to trenches. The model was run for each stream crossing and trench incorporating the input parameters and mitigation measures summarized in Table D-4. A detailed spreadsheet is provided in the Project Record.

Mitigation of Drilling Program Activities

The mitigations required for drilling differ by alternative. Alternative B, based on AIMMs proposed Plan of Operations, contains no mitigation measures related to the drilling program, so Alternative B will not be discussed further in this section.

Alternative C assumes that most drilling locations would be accessible by road and located no closer to perennial or intermittent streams than 100 feet. Drilling rigs would likely be either tracked or truck-mounted. If geological considerations require drill sites to be located closer to streams than the 100-foot buffer, or additional off-road holes are requested, this would only be permitted with hand-portable drilling rigs according to the requirements in Alternative D.

Alternative D assumes no new roads would be constructed and all drilling would be done with portable rigs that are moved to the site by hand or by pack stock. Under this alternative, drill sites may be located as close as 50 feet from perennial or intermittent streams.

The following section is organized by separate activities within the drilling program. The risks associated with each activity are defined and the mitigations by alternative are described. These mitigations were developed as the best means to reduce the identified risks. AIMM may wish to propose alternative techniques to achieve comparable risk reduction. Such proposals would be subject to Forest Service review and approval.

Road construction

Mitigation measures that apply to the drill pad access roads are described in the Roads and Access Management section and in Best Management Practices in Appendix D.

Drill pad construction

Alternative C

- Pads shall not be located less than 100 feet from a perennial or intermittent stream. Drill pads will be located directly in the roadway on grade breaks that have a maximum slope of 10%. Potential ground disturbance (e.g. cut and fill volumes and pad dimensions) will be minimized at drilling sites by locating the drill sites prior to road construction as outlined below.

- Drill holes indicated on the map (Figures 2-2, 3-3) are approximate only. Exact drill pad location will be approved and flagged on the ground by the Forest Service. Siting will involve balancing geological constraints (drill target depth and direction) with erosion control considerations (flow path to nearest stream channel, slope, surface material cohesion, vegetation, presence of down slope obstructions, etc.).

Alternative D

- Pads shall not be located less than 50 feet from a perennial or intermittent stream. Ground disturbance (e.g. cut and fill volumes and pad dimensions) will be minimized at drilling sites. The minimum pad size is approximately 175 square feet (which may not need to be a contiguous level surface). Leveling of equipment pad(s) may be accomplished by hand

digging and the use of wood cribbing. If on-site timber is to be used for cribbing, the Forest Service shall designate which trees may be cut.

Water supply

Alternatives C and D

- Water will be conducted from adjacent streams to the drill pads by means of a flexible plastic pipe. This has the potential to cause soil erosion if the line were to break while in use. The risk of sediment delivery to a stream would increase with increasing proximity to water and increasing hydrostatic head in the line. This will be mitigated by laying the line slightly inclined to the land contour so excessive head is not developed at the discharge end. A shut-off valve will be installed at the discharge end. If water use at the pad is not anticipated for more than two days in a row, the intake end of the line will be removed from the stream. No mechanical excavation of the stream channel will be allowed at the pipe inlet. Rocks may be placed by hand to position the inlet end of the pipe properly. The Forest Service will approve the inlet location and line route.

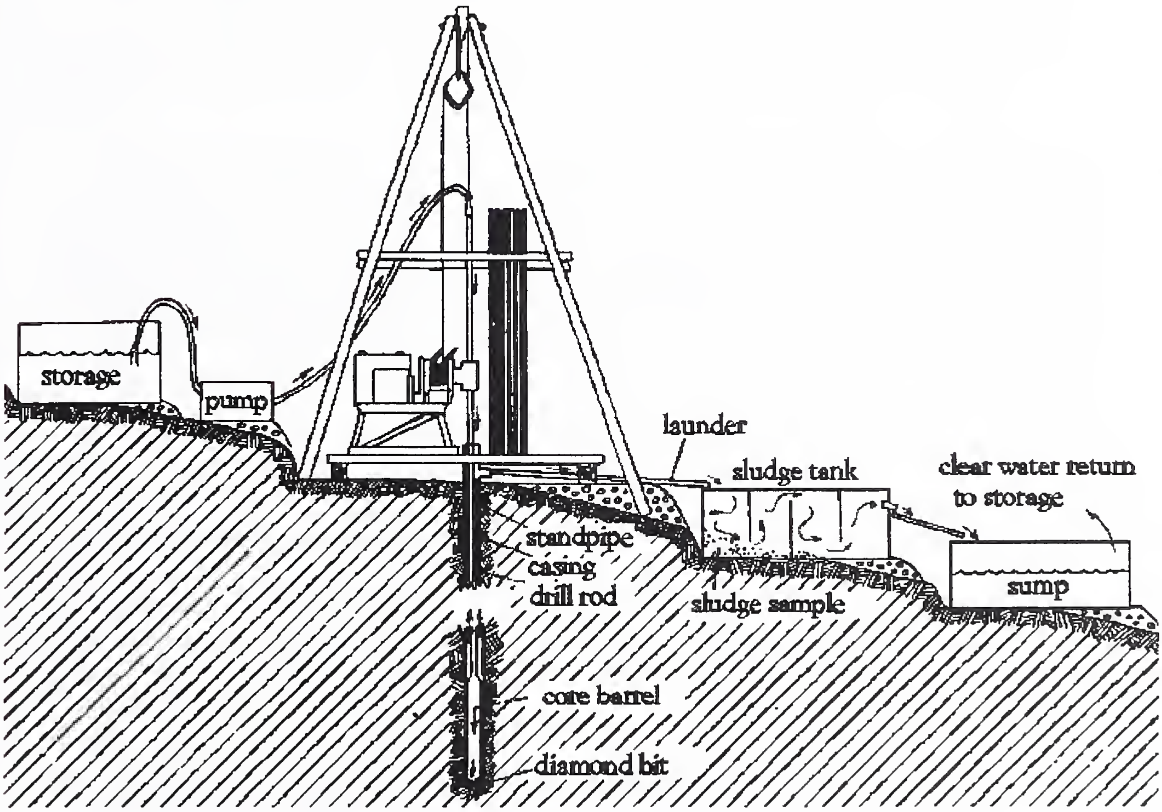

Figure D-1. (from USDA Forest Service 1995e)

Drilling

Figure D-1 shows a schematic diagram of a typical portable exploration drill rig. Tracked or truck-mounted rigs will have similar basic components. Drill holes will be constructed and

abandoned in accordance with the minimum well construction standards set by the Idaho Department of Water Resources (IDAPA 37.03.09, 1993).

Alternative C

- One concern during operation is possible hillslope erosion and/or contamination of perennial streams by accidental or emergency release of drilling fluids. Such situations could arise if the drilling fluid circulation system (pumps, lines, and tanks) were somehow breached allowing a high volume discharge. Another possibility is, that if the borehole intercepts groundwater, the inflow could exceed the capacity of the storage tanks and excess fluid would have to be discharged. It is not possible to calculate the probability of either of these events occurring, but it would certainly be greater than zero. While there are no extensive aquifers known in the area, and the formations being drilled are metamorphic and igneous rocks having little primary permeability, the existence of high permeability water-filled fracture zones is still a possibility.

- The risk of accidental or emergency discharge will be mitigated by providing emergency containment for drilling fluids. A settling basin will be excavated which has sufficient volume to contain 120% of the maximum volume of fluid expected to be used. The settling basin will be located at the lowest point on the pad downslope of all potential discharge sources. If a sump tank is used, it will be placed directly upslope from this basin. All open tanks in the circulation system will maintain a minimum of 6 inches of freeboard.

- Another risk is drilling fluid toxicity and potential adverse effects to soils, water, and wildlife of an accidental or emergency discharge. The proponent has not specified what drilling fluid additives (if any) will be used for the drilling operation. Drilling fluids will be water-based. Prior to project implementation a list of all proposed additives, including their Material Safety Data Sheets (MSDS) and any environmental testing data available, must be submitted for FS approval. When a less toxic substitute exists for a proposed additive, the Forest Service may require it's use. All products shall be used according to the manufacturer's directions. Liquid drilling fluid additives will be stored on site in the same spill containment system as the one required for petroleum products. Pipe thread compound shall be non-petroleum based and heavy metal free.

- Leakage of fuel, oil, or hydraulic fluid from drilling equipment poses another risk to the environment. All equipment to be used will be inspected by the Forest Service to ensure it is in good working order and has no visible leaks. Oil absorbent pads will be available on site and placed in advance under the drilling platform and any possible sources of fuel, oil, or hydraulic fluid leakage. If open tanks are used for drilling fluids, oil absorbent pads will be floated on the surface during operations to absorb any petroleum-based contaminants. Spill containment will be required for all petrochemicals on site. The operator will adhere to the guidelines pertaining to transport, storage, handling, and disposal of hazardous materials and spill response cited in Chapter 7 of the BMPs for Mining in Idaho (1992).

Alternative D

- Emergency containment for drilling fluids will be provided by installing silt fence below the drill pads. The silt fence shall be properly installed immediately down slope of the lowest component of the drill rig. The fence shall be installed with the ends upslope from the center to form a water retention basin having a volume capable of containing 120% of

the maximum volume of fluid expected to be used. In addition, the operator will provide a pump and line (deployed in advance) capable of moving excess drilling fluid to a Forest Service-approved surface discharge location outside the 100' stream buffer. The discharge area will be selected to minimize the potential for surface erosion and to maximize the infiltration capacity and flowpath length to live water.

- The pumping system for the drilling rig may be used for moving excess fluid to the discharge site, but a separate high-volume, low-pressure variable-speed trash pump must be available on site for back-up. The pumping system must be used if 1) the volume of fluid discharged to the silt fence basin threatens to exceed its capacity, or 2) the filtered fluid is starting to cause rilling of soils below the fence, or 3) poor infiltration of the filtered fluid below the fence is allowing overland flow to come within 20 feet of a stream.

- The drilling fluid must be water only. No additives will be permitted. Hydraulic fluid used on the drill rig shall be vegetable oil-based.

- Use of oil-absorbent pads, spill response, and the transport, storage, handling, and disposal of hazardous materials will also be the same as for Alternative C.

Drilling fluid disposal

Alternative C

- Drilling fluid will be discharged in a controlled manner to the excavated settling basin described in the Drilling section. If a hydrocarbon sheen is visible on the surface of the fluid in any open tanks, oil-absorbent pads will be used to remove all hydrocarbon contaminants prior to discharge. This inspection will be repeated once all the fluid has ponded in the settling basin, and any further hydrocarbon contamination removed. After the fluid has infiltrated into the basin, it will be backfilled prior to reclamation.

Alternative D

- Drilling fluid will be pumped to a Forest Service-approved surface discharge location outside the 100' stream buffer as described in Alternative D of the Drilling section. The same requirements for hydrocarbon contaminant removal as described for Alternative C will apply.

Drill hole abandonment

Alternatives C and D

- After completion of the drill hole, any casing must be either removed or cut off two feet below the ground surface. The hole must be backfilled with the cuttings and plugged as described in Chapter 6 of the Best Management Practices for Mining in Idaho (1992). Abandonment must also be in accordance with the specifications outlined by the Idaho Department of Water Resources in IDAPA 37.03.09, Rule 25, section 12.

Drill pad reclamation

Alternative C

- Because the drill pads are located on the running surface of abandoned roadbeds or new road prisms, their final reclamation will be the same as for roads. This will consist of complete recontouring to the original slope shape and revegetation of the disturbed ground.

Alternative D

- Any milled wood used to construct the drilling platforms will be removed from the wilderness. Timbers cut locally for platform construction will be scattered about the site. Any material excavated during platform leveling will be backfilled with hand tools.

APPENDIX E. MONITORING PLANS

Contents

Minerals and Geology Monitoring

Program: Minerals and Geology

Activity, Practice, or Effect: Mineral Development

Project Name: Golden Hand Mine No. 3 and No. 4 Lode Mining Claims Proposed Plan of Operations

Location: Sec 26, T22N, R9E Boise Meridian

Objectives: Ensure compliance with approved plan of operations

Monitoring Type: Compliance

Parameters:

- Any material non-compliance documented. If resolved in field without written Notice of Non-compliance, provide written documentation of issue, resolution, and photographs (if applicable) for approval of FS authorized officer
- Provide daily documentation of work progress, effects, visitor conflicts

Methodology:

- Site visits
- Photo log
- Video documentation
- Report copies to District Ranger, Wilderness Program Manager, AIMM authorized representative

Frequency/Duration: Daily, life of project

Data storage: Forest Minerals files

Analysis: Interdisciplinary (Wilderness, Soil and Water, Fisheries, Planning)

Report: Monthly summary; Annual, after seasonal closeout

Cost: $7,000/year

Personnel: Forest Minerals and Wilderness personnel

Responsible Individual: Geology Program Manager

Responsible Official: Krassel District Ranger

Prepared by: Jim Egnew, Minerals & Geology Program Manager **Date:** 1/27/03

Water Quality Monitoring

Program: Soil and Water Resources

Activity, Practice, or Effect: Clean Water Act compliance for underground mine development and drilling

Project Name: Golden Hand Mine No. 3 and No. 4 Lode Mining Claims Proposed Plan of Operations

Locations: Adit and drill hole discharges at the Golden Hand Mine site

Objectives: Verify compliance with Clean Water Act. Underground development has the potential to increase flows from the adit and degrade water quality. Flowing drill holes also have the potential to degrade water quality. Monitoring of these discharges would provide early warning of potential degradation of water quality

Monitoring Type: Water Quality

Parameters: All regulated metals, nitrate, pH, specific conductance, and flow. Any flow of water encountered during drilling operations or underground development that exceeds 10 gpm would be reported immediately to the Payette National Forest

Methodology: Use standard EPA water sampling protocols. The detection limits for metals should be low enough to be able to compare to EPA chronic aquatic standards

Frequency/Duration: Monitoring will be conducted at the beginning and end of each operating season

Data storage: Krassel Ranger District

Analysis: PNF Specialists

Report: Field notes and laboratory data sheets kept on file at the Krassel Ranger District

Cost: $100-$200 per sample for lab analyses

Personnel: Monitoring conducted by operator

Responsible Individual: Minerals Program Manger

Responsible Official: Krassel District Ranger

Prepared by: Joe Gurrieri, Reclamation Specialist/Hydrogeologist

Date: 1/23/03

Best Management Practices Monitoring

Program: Soil and Water Resources

Activity, Practice, or Effect: Implementation and effectiveness of best management practices (BMPs), soil and water conservation practices (SWCPs), management requirements, and mitigation measures.

Project Name: Golden Hand Mine No. 3 and No. 4 Lode Mining Claims Proposed Plan of Operations

Locations: FR 371, FR 373, FS Trail #013, and Golden Hand Mine Claims #3 & #4 (T22N, R9E, sec. 26)

Objectives: Determine if site-specific BMPs and SWCPs, management requirements, and mitigation measures identified in the environmental impact statement and decision notice are being implemented. Provide qualitative assessment of effectiveness of BMPs, SWCPs, management requirements, and mitigation measures.

Monitoring Type: Implementation and effectiveness

Parameters: Site-specific BMPs, SWCPs, management requirements, and mitigation measures

Methodology: The Decision Notice and NEPA document will be reviewed in the office, and a checklist of BMPs, SWCPs, management requirements, and mitigation measures will be developed. Field notes and photographs will be taken at sites where practices and measures are implemented.

Frequency/Duration: Monitoring will conducted at the end of each operating season.

Data storage: Results and photos will be stored in the Soil and Water files in the Krassel District Office.

Analysis: A qualitative assessment of the implementation and effectiveness of each practice and/or measure will be made. Corrective actions will be identified for any practice and/or measure for which the effectiveness is less than satisfactory.

Report: Annual monitoring results reports (along with a summary form) will be prepared. A final report will be prepared upon project completion.

Cost: On an annual basis once project activity begins: Zone Hydrologist for 4 days at $265/day = $1060, Zone Hydrologist Technician for 8 days at $130/day = $1040 **Total** = $2100

Personnel: GS-9/11 Hydrologist, GS5/6/7 Hydrology Technician

Responsible Individual: East Zone Hydrologist

Responsible Official: Krassel District Ranger

Prepared by: John Rygh, Geologist Date: 2/20/03

Wilderness Monitoring (Access)

Program: Wilderness/Recreation/Trails

Activity, Practice, or Effect: Visitor Use monitoring and compliance check

Project Name: Golden Hand No. 3 and No. 4 Lode Mining Claims Proposed Plan of Operations

Locations: In the FC-RONR Wilderness on Trail #013

Objectives: Gather visitor use data and check for compliance regarding motorized and mechanized use

Monitoring Type: Camera

Parameters: Number of visitors entering and number of vehicles

Methodology: Camera

Frequency/Duration: Each season over the life of the project

Data storage: Krassel Ranger District files

Analysis: Change in amount of visitor use and unauthorized motorized /mechanized use

Report: Krassel District Visitor Use Data

Cost: ~$2500 for camera system and ~$500 per year

Personnel: Wilderness Aid for installation and monitoring

Responsible Individual: Recreation and Wilderness Management Resource Specialist

Responsible Official: Krassel District Ranger

Prepared by: Jennifer Blake, Wilderness Specialist

Date: 1/29/03

Wilderness Monitoring (Visitor Use)

Program: Wilderness/Recreation/Trails

Activity, Practice, or Effect: Road Use monitoring

Project Name: Golden Hand No. 3 and No.4 Lode Mining Claims Proposed Plan of Operations

Location: Smith Creek Road

Objectives: Gather visitor use data and check for compliance regarding motorized and mechanized use

Monitoring Type: Road counter

Parameters: Number of vehicles traveling up Smith Creek Road

Methodology: Road Counter

Frequency/Duration: Each season for the life of the project

Data storage: Krassel District files

Analysis: Amount of motor vehicles up Smith Creek Road

Report: Krassel District Visitor Use Data

Cost: ~$1500 for counter system and installation and ~$500 per year

Personnel: Wilderness Aid for installation and monitoring

Responsible Individual: Recreation and Wilderness Management Resource Specialist

Responsible Official: Krassel District Ranger

Prepared by: Jennifer Blake, Wilderness Specialist

Date: 1/29/03

Wilderness Monitoring (Occupancy)

Program: Wilderness/Recreation/Trails

Activity, Practice, or Effect: Camp Inspections

Project Name: Golden Hand No. 3 and No. 4 Lode Mining Claims Proposed Plan of Operations

Location: Golden Hand No. 3 and No. 4 Lode Mining Claims

Objectives: Check for camp use compliance and 'Leave No Trace' camping techniques

Monitoring Type: Site visit

Parameters: Condition of camp location

Methodology: District camp inspection monitoring forms

Frequency/Duration: 3 + times per year for the duration of project

Data storage: Krassel Ranger District files

Analysis: To ensure that camp is operated consistent with what approved in the Plan of Operations

Report: Compliance with Plan of Operations

Cost: ~$500 per year

Personnel: Wilderness Program Assistant

Responsible Individual: Recreation and Wilderness Management Resource Specialist

Responsible Official: Krassel District Ranger

Prepared by: Jennifer Blake, Wilderness Specialist

Date: 1/29/03

Wilderness Monitoring (Social Impacts)

Program: Wilderness/Recreation/Trails

Activity, Practice, or Effect: Social impact monitoring

Project Name: Golden Hand No. 3 and No. 4 Lode Mining Claims Proposed Plan of Operations

Location: Along Mosquito Ridge, Cow Corrals, Crane Meadows and Ramey Ridge

Objectives: Monitor the impacts of operations on wilderness experience by sight and sound.

Monitoring Type: On site travel

Parameters: Sights and sounds of impacts along ridges surrounding the Golden Hand

Methodology: Make observations of the effects of the visual and audible impacts while hiking along ridges surrounding project area.

Frequency/Duration: 1 trip per season for the duration of the project

Data storage: District files

Analysis: Effect to Wilderness user's experience

Report: Wilderness Impact Monitoring

Cost: ~$500 per year

Personnel: Wilderness Program Assistant

Responsible Individual: Recreation and Wilderness Management Resource Specialist

Responsible Official: Krassel District Ranger

Prepared by: Jennifer Blake, Wilderness Specialist

Date: 1/29/03

Fish Habitat Monitoring

Program: Fisheries

Monitoring Item: PACFISH compliance

Project Name: Golden Hand #3 and #4 Lode Mining Claims Plan of Operation

Location: Logan Creek, Hogback-McFadden, Smith Creek, Lower Beaver Creek, Upper Beaver Creek subwatersheds

Priority: High

Objectives: Verify compliance with PACFISH RHCA widths, and compiance with PACFISH standards and guidelines

Parameter: Determine whether buffer strip widths are adequate, and in compliance with those in the "Interim Strategies for Managing Anadromous Fish-producing Watersheds in Eastern Oregon and Washington, Idaho, and Portions of California". Determine whether activities are consistent with standards and guidelines for roads management, recreation management, minerals management, and general riparian area management in PACFISH. Determine whether the action is near enough to the fish during spawning season to warrant protection if project duration will be extended past August 15th

Methodology:

Frequency/Duration: Frequency: Once during spawning season for chinook, steelhead, and westslope cuttroat. For bull trout, monitoring will occur biweekly after August 15th through October 1st or when the work season is over.

Data Storage: Field notes would be on file in fisheries office at Krassel Ranger District and McCall Supervisors Office.

Analysis/Report: Field notes and site-visit observations of activities

Personnel: District Fisheries Biologist

Projected Costs: Fisheries Biologist and/or Minerals Specialist for 7 visits (14 days) = $3,000 per year

Responsible Individual: District Fisheries Biologist and Minerals Specialist

Responsible Official: District Ranger

Preparer: Deborah Artimez, Fisheries Biologist

Date: 1/24/03

Cultural Resources Monitoring

Program: Heritage Program

Activity, Practice, or Effect: Archival National Park Service level photographic mitigation is a requirement prior to earth disturbance of any cultural resources including the adit portals. A Memorandum of Agreement (MOA) will be signed with the Idaho State Historic Preservation Office (SHPO).

Project Name: Golden Hand No. 3 and No. 4 Lode Mining Claims Proposed Plan of Operations

Locations: Golden Hand claims No. 3 and No. 4

Objectives: Produce archival quality photographic documentation in compliance with Section 106 of the National Historic Preservation Act, and in honoring the intent of the MOA with the SHPO. The SHPO made a request that the ore mill site not be disturbed, which includes the three boilers and associated smoke stack and machinery.

Monitoring Type: Cultural resources monitoring and mitigation will take place in summer 2003.

Parameters: MOA mitigation measures must be accepted by the SHPO prior to any disturbance to cultural features at the Golden Hand Mine.

Methodology: The Heritage Program Manager will do the required field photography and follow through with the MOA mitigation requirements in early summer 2003.

Frequency/Duration: One visit in early summer 2003, and one visit during the summer of 2004.

Data storage: Hard copy documentation will be stored in the Heritage Program files at the Supervisor's Office, Payette National Forest, McCall, Idaho.

Analysis: A contextual historic narrative will be produced for the interested public.

Report: PY2002-1626 and PY2003-1675

Cost: Mitigation and monitoring costs will be approximately $3,000.

Personnel: Lawrence A. Kingsbury, Heritage Program Manager

Responsible Individual: Heritage Program Manager

Responsible Official: Krassel District Ranger

Prepared by: Lawrence A. Kingsbury, Heritage Program Manager

Date: 1/25/03

Noxious Weeds Monitoring

Program: Rangeland Resources

Activity, Practice, or Effect: Noxious weed eradication and control

Project Name: Golden Hand Mine No. 3 and No. 4 Lode Mining Claims Proposed Plan of Operations

Locations: Sec 26, T22N, R9E Boise Meridian

Objectives: Prevent the establishment and spread of noxious weeds in the area of the Golden Hand Mine. Determine if control and/or eradication of noxious weed species is obtained by mechanical and other methods.

Monitoring Type: Visually inspect for noxious weed presence in the area of the Golden Hand Mine.

Parameters: Change from the baseline. Currently there are no noxious weed infestations.

Methodology: Inventory of noxious weed species. If noxious weeds establish and spread, their locations would be recorded, and the species would be identified along with the density, ecological site information, and type of treatment applied.

Frequency/Duration: Once annually at the end of each operating season and for five years after the close out of operations.

Data storage: Krassel Ranger District weed files.

Analysis: Written report.

Cost: $300 per year. Total- $2,400 to $4,500 (depending on length of operating season)

Personnel: Noxious weed crew

Responsible Individual: Minerals Program Manager

Responsible Official: Krassel District Ranger

Prepared by: Shannon Campbell, Writer/Editor

Date: 1/30/03